# ANNUAL REPORT-1979

# Council of Economic Advisors

Commonwealth of Kentucky
Julian M. Carroll, Governor

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# Council of Economic Advisors

## ANNUAL REPORT-1979

Development Cabinet
Commonwealth of Kentucky

## THE KENTUCKY COUNCIL OF ECONOMIC ADVISORS

The Kentucky Council of Economic Advisors was created by Executive Order in December 1970, and was confirmed by the legislature in Chapter 147B, Kentucky Revised Statutes in the 1972 regular session. Its functions are as follows:

1. To collect, compile, and interpret economic data concerning the economy of the Commonwealth (including employment, unemployment, wages, personal income, profits and other socieconomic information).
2. To make economic projections and recommendations.
3. To undertake such other related tasks as may be requested by the Governor.
4. To report to the Governor at the beginning of each fiscal year and calendar year on the state of the economy of the Commonwealth.

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This report is one in a series of special reports and continuing research activities conducted for the Kentucky Council of Economic Advisors (KCEA) by staff of the Office for Research, College of Business and Economics, University of Kentucky. Other reports include an annual *Personal Income Report,* prepared in conjunction with the Kentucky Department of Commerce; the quarterly *Kentucky Economy: Review and Perspective;* and the Policy Papers Series, in which one to four studies are published each year. Other programs include the development and maintenance of the Kentucky Economic Information System (EIS), a computerized system of several thousand economic data series and related software, which was made operational on the State Government computer in Frankfort in early 1979; and the preparation of short-term and long-term economic forecasts for Kentucky.

In publishing any of its reports, the KCEA believes that the report represents a competent treatment of the subject, undertaken in an objective fashion and, accordingly, worthy of public consideration. The interpretations and conclusions in such publications are those of the authors, and do not purport to reflect the views of the Council; of the Administrative Officers, faculty, or staff of the College of Business and Economics; or of any other unit of the University of Kentucky.

The staff of the KCEA was particularly pleased during the past year with the support and interest provided by the Council members: William L. Short, Willis Weatherford, H. Clyde Reeves, John S. Swift and General Dillman Rash. Special thanks are extended to retiring Council member General Rash, who maintained an active interest in KCEA activities during his term of office on the Council. The staff also looks forward to working with John Clarke of Louisville, who recently accepted tenure on the Council.

This report contains assessments of the recent and prospective economic performance of the United States and Kentucky, prepared principally by Dr. Charles Renfro. Another chapter, by Dr. Lawrence K. Lynch, reports on a study of Kentucky's comparative economic and public sector performance; and a chapter by Dr. Charles W. Hultman evaluates Kentucky's position in the energy situation. In addition, two chapters have been prepared by professionals who are not regularly associated with the KCEA: Dr. Stephen E. Lile, who analyzes comparative family tax burdens; and Dr. Don Soule, who clarifies the concepts of "tax effort" and "tax burden." Special thanks are extended to these two individuals.

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Lawrence K. Lynch
Executive Director
Kentucky Council of Economic Advisors

# PREFACE

Economic issues are of critical importance to Kentuckians–and indeed, to all Americans–in mid-1979. The persistent problem of inflation, the likelihood of recession in the near future, the energy crisis, and the so-called "tax revolt" are all reported daily in the press and other media and discussed endlessly by businessmen, government officials and concerned citizens. In this eighth annual report of the Kentucky Council of Economic Advisors, attention is given to each of these issues in order to provide a foundation for state government policy decisions. The Council cannot, to be sure, resolve all the economic problems plaguing Kentucky; but we can provide sound economic data and, we hope, intelligent economic analyses that can be relied upon by policymakers.

Chapter I, "The National Economic Situation," by Dr. Charles Renfro, reviews U.S. economic performance in 1978, and suggests that a nationwide recession may not be imminent. Renfro blames the recent surge in inflation primarily upon developments in agriculture, federal government policies, the weakness of the dollar, and a population mix dominated by young families. His argument for a "soft landing" rather than a recession is based upon an expected high level of business investment spending which will partially offset some weakness in consumer expenditures, a strengthening in exports, the lack of a large inventory buildup which has preceded other postwar recessions, and a belief that consumer spending will not fall sharply, despite the current high levels of consumer debt. It may be that Renfro places too much of the blame for inflation on federal government actions and policies and that the probability of a mild recession is somewhat greater than he projects. However, except for psychological reasons, the impact of a short, mild recession is not likely to be much different than the impact of a short period of very slow economic growth. In both cases, unemployment will rise slightly and, hopefully, inflation will ease.

Dr. Renfro also authored Chapter II, "The Kentucky Economic Situation," together with Paul Coomes. This chapter is of particular interest because the two alternative forecasts of the Kentucky economy, which are presented along with the control forecast, represent simulations of the likely effects of alternative policy decisions. The control forecast predicts the economic consequences for Kentucky if the Wharton "soft landing" forecast for the U.S. is realized: moderate growth in employment, some increase in the unemployment rate, and rather rapid growth in personal income, much of which is due to continued high inflation. The first alternative forecast simulates what would have happened to the Kentucky economy if residential utility bills had not been exempted from the sales and use tax by the 1979 Special Session of the Kentucky General Assembly. The results indicate that the exemption had a moderately beneficial effect on Kentucky's employment and personal income. The second alternative forecast simulates the effects of a sharper reduction in Federal Grants-in-Aid to states than assumed in the control forecast. If Grants-in-Aid are reduced to the level recommended by President Carter, Kentucky's employment and personal income will be decreased, and the unemployment rate will rise slightly.

Chapter III, "Kentucky's Economy: How Does It Compare?" by Dr. Lawrence K. Lynch, shows that Kentucky's economic performance in the 1970s has been excellent relative to major U.S. regions. Kentucky is growing at about the same rate as the other Sunbelt states, and well in excess of the U.S. average. Lynch also points out that, while Kentucky's public sector has been growing rapidly, its total tax effort–taxes as a percentage of personal income–is still relatively low.

In contrast, Dr. Stephen E. Lile argues in Chapter IV, "Kentucky Taxes: How Do They Compare?" that Kentucky is a high-tax state in terms of family tax burden. If taxes on business are ignored, and if taxes borne directly by families in the largest city of each state are compared, Kentucky does have a relatively high level of taxes.

"Is Kentucky A Low-Tax or A High-Tax State?" by Dr. Don M. Soule, attempts to resolve the apparent contradiction in the Lynch and Lile articles. Soule distinguishes between "tax effort," a measure of how

fully a state utilizes its taxing capacity, and "tax burden," a measure of how heavily families are taxed. Kentucky has a low tax effort, as Lynch reported, chiefly because its business taxes are low; Kentucky has a high tax burden, as Lile reported, because its personal taxes are relatively high.

In Chapter VI, "Energy Factors Affecting the Kentucky Economy," Dr. Charles Hultman takes a look at energy-related developments which will affect the economic health of Kentucky over the next decade. He argues that coal will play an increasingly important role in U.S. energy supplies, despite some unresolved issues concerning environmental regulations and coal transportation. Kentucky will benefit from increased coal production both directly through expanded mining activities, and indirectly through development of energy-intensive and market-related industries.

The economic situation in mid-1979 is clothed in uncertainty; indeed, the economic signals appearing in widely-reported data series have perhaps never before been as contradictory. Nevertheless, the Council is optimistic in its short-term forecast and long-term outlook. We believe that if an economic recession does occur, it will be mild and short-lived. And we believe that Kentucky's inherent economic strengths will lead to continued economic progress in the decade ahead.

Charles W. Hultman
Chairman
Kentucky Council of Economic Advisors

# I. The National Economic Situation

by Charles Renfro

As an alternative to recession, the idea of bringing the economy in for a "soft landing" has an obvious appeal for an Administration, particularly in a year just before an election. As a policy, a "soft landing," featuring an extended period of either very slow economic growth or no growth, implies some degree of abatement in inflationary pressures and possibly some reduction in the inflation rate, yet only a minimal rise in unemployment compared to a recession. Given a complete range of choices, this policy is not what a President would necessarily choose to underpin his next election campaign, but it appears to be the best of the options currently available.

It is a risky option nevertheless. First, there is the problem that a policy of restraint may bring only some degree of economic stagnation, not a significant decrease in the rate of inflation. Secondly, there is the problem of actually achieving a "soft landing."

The subject of this chapter is the outlook for the United States economy during the next two years. However, in order to predict the future, it is necessary to first consider the performance of the economy in the recent past. This chapter is therefore divided into two principal parts. In the first part, the economy's behavior in 1978 is reviewed in order to define the state of the economy at the beginning of 1979. The second part provides an assessment of the economic outlook for 1979 and 1980.

## The U.S. Economy in 1978

There are at least two perspectives from which the year 1978 can be viewed. It can be viewed as a year of continued economic recovery from the recession of 1974-75. Not only did the recovery continue, but the economy's rate of growth–measured by the rate of change in real Gross National Product–was nearly 4 percent. This growth lead to a general improvement in economic well-being. In 1978, real disposable personal income increased by 4.3 percent, as compared to 4.1 percent for 1977. Over the year, the unemployment rate fell; in November 1978, it was 5.8 percent, and for the year it was 6.0 percent, a full percentage point below the 7.0 percent of 1977. At year's end, nearly 60 percent of the population 16 and over was employed. These circumstances provide evidence of continued healthy economic performance.

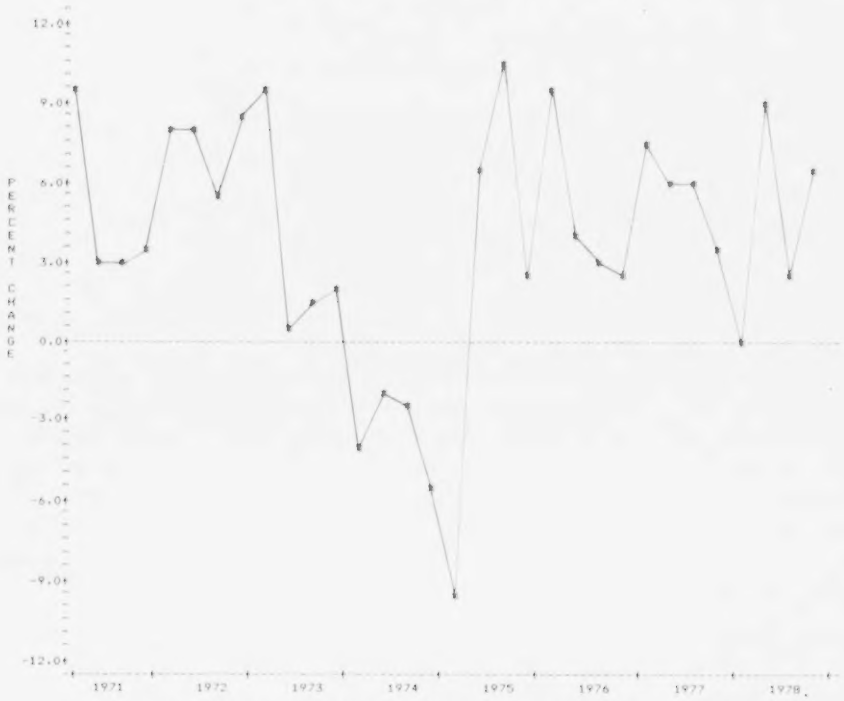
Alternatively, 1978 can be viewed in a somber light. During 1978, there was acceleration in the rate of inflation. For the year as a whole, the rate of inflation, measured in terms of the Gross National Product deflator, was in excess of 8 percent; measured in terms of the Consumer Price Index for all urban wage and clerical workers, it was 7.6 percent–as compared to 6.2 percent for 1977. By any measure, the inflation rate for 1978 was the highest since 1974. Furthermore, during the year other problems surfaced which, if taken together with the higher inflation rate, may portend the onset of a new recession sometime during the next two years. The overthrow of the Shah, and the continued unsettled conditions in Iran, threaten a gasoline shortage in the United States serious enough to require consideration of gasoline rationing; the events in Iran have already lead to higher oil prices worldwide. During the year, there was also a further weakening of the dollar on foreign exchange markets. In addition, there is evidence from the economy's performance in 1978 that a serious decline may have occurred in the long-term potential growth rate of the economy. Finally, in the recent pattern of expenditures for housing and consumer durables, it is possible to see economic behavior in the face of high rates of inflation which differs from the historical behavior of U.S. consumers, and which may increase the danger of an inflationary boom followed by bust. These are some of the circumstances that must be considered in order to evaluate the implications of the economy's performance in 1978.

### Prices

The increased rate of inflation in 1978 appears to have been caused by a number of factors acting in concert, including the weather, government policies, recent legislation, and domestic and international economic conditions.

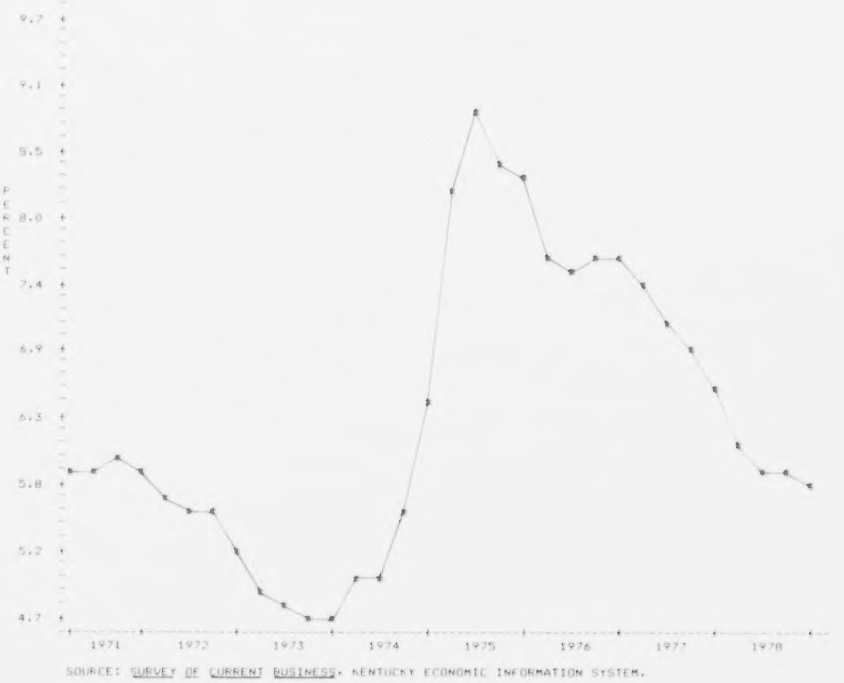
A primary reason for the higher inflation rate was a rise in food prices. Measured in terms of the Consumer Price Index, there was an increase of nearly 12 percent in food prices reflecting, in particular, a rise in producer prices for both meat and grains. Beef and veal producer prices were up by more than 26 percent for the year. The price increase for cattle exceeded 39 percent. Pork

FIGURE1. PERCENT CHANGE IN QUARTERLY REAL GROSS NATIONAL PRODUCT



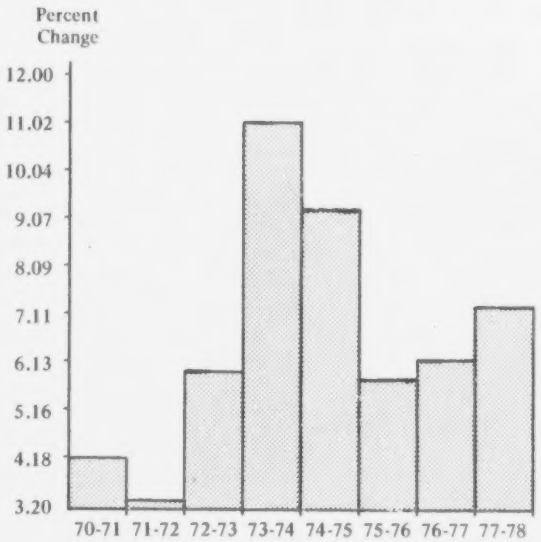

SOURCE: SURVEY OF CURRENT BUSINESS, KENTUCKY ECONOMIC INFORMATION SYSTEM.

FIGURE 2. UNITED STATES QUARTERLY UNEMPLOYMENT RATE




SOURCE: SURVEY OF CURRENT BUSINESS, KENTUCKY ECONOMIC INFORMATION SYSTEM.

FIGURE 3. ANNUAL PERCENT CHANGE IN CONSUMER PRICE INDEX FOR URBAN WAGE AND CLERICAL WORKERS




SOURCE: *Survey of Current Business*, Kentucky Economic Information System.

prices rose by more than 11 percent. As for grain prices, a 23 percent increase in wheat prices in 1978 helped to cause a grain producer price increase of more than 10 percent.

To some degree, the rise in meat prices was expected. In late 1977, the concensus forecast was that there would be a supply shortage in beef cattle. However, the hog supply shortage which developed in 1978 was unforeseen. In late 1977, it had been expected that there would be a substantial increase in farrowings. These expectations resulted in forecasts by agricultural economists that hog prices would drop in 1978, due to the consequent increase in the supply of hogs. However, unfortunately for the consumer, the combination of weather conditions unfavorable to farrowing in early 1978 and the reaction of farmers to the forecasted hog price declines in 1978 lead to the opposite result.

The sharp increase in meat prices can be viewed as being the result of weather and market conditions. In contrast, the grain price increase was due in large part to particular government farm programs, specifically the long-term grain reserve and the acreage set-aside and diversion programs. The first of these, by increasing the demand for grain in 1978, helped to increase the price. The other two programs helped to increase prices by reducing the supply. Other factors which affected grain prices in 1978 were the increased availability of on-farm storage facilities and a strong export demand for grains late in the year. A moderating effect on price was provided by the generally favorable weather conditions worldwide which, for instance, lead to a record domestic corn harvest and, hence, a relatively small 1.8 percent increase in U.S. corn prices in 1978.

Farm programs were not, however, the only government policy initiatives which helped to raise prices in 1978. Two other inflationary events of 1978 were the increases in the Minimum Wage and in employer social insurance contributions, both of which were a direct consequence of federal legislation. As of January 1, 1978, the Minimum Wage was increased from $2.30 to $2.65 an hour. At the same time, the maximum taxable social security wage base was increased from $16,500 to $17,700. In addition, the combined employer-employee tax rate was increased that month from 11.7 percent to 12.1 percent, the increase shared equally by the employer and employee. Furthermore, in 1978, there was also a federally mandated increase in the minimum wage base for the unemployment insurance programs that affected most of the fifty states. These legislated changes each represent an increase in the cost of doing business. They become inflationary as they are passed on to the consumers in the form of higher product prices.

There were, in addition, government policy initiatives which had a more direct effect on the measured rate of consumer price inflation in 1978. The costs of home ownership are measured as a sub-item index of the Consumer Price Index, and these costs are assigned a consumer budget weight of approximately 23 percent. One effect of Federal Reserve monetary policies in 1978 was to raise the mortgage rate of interest. The rise in mortgage rates, coupled with increased house prices in 1978, had the effect of increasing the costs of home ownership.

Government policies that cause an increase in the Consumer Price Index have a pervasive inflationary impact on the economy because of the fact that the index serves as a trigger for escalation clauses in labor contracts, and as the basis for adjusting federal government pensions, social security payments and food stamp disbursements, as well as for a host of other such purposes.[1]

A further stimulus to price inflation during 1978 was the weakness of the dollar. Devaluation of the dollar has the effect of raising at least some prices and there are two ways, in particular, in which such price rises occur. There is, of course, the direct increase in the price of imported goods and services. However, in addition, these price rises make it possible for the prices of competing domestically produced goods and services to be raised. At the same time, by making U.S. produced goods and services cheaper abroad, devaluation of the dollar also increases the demand for these by

foreigners; this increased demand supplements the domestic demand for U.S. produced goods, thus putting upward pressure on prices. Particularly in the absence of U.S. Government policies to reduce domestic demand for goods and services, the effect of a decline in the foreign exchange value of the dollar is to increase the rate of inflation.

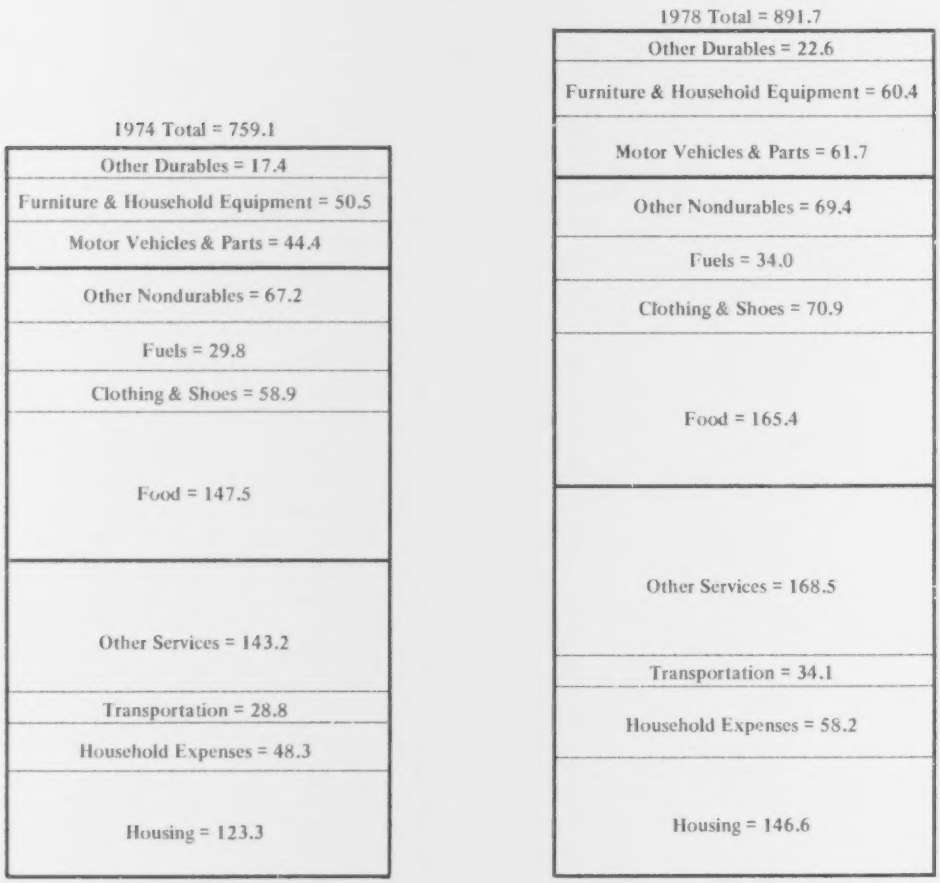
## Personal Consumption Expenditures

The discussion has stressed the cost-related factors which helped to generate a higher rate of inflation in 1978. However, the degree to which cost increases can be passed on in the form of higher retail prices depends to a large extent upon the strength of consumer demand—the ability and willingness of the consumer to purchase.

In 1978, the consumer remained willing to purchase, but while there was still solid growth of 4 percent in the volume of purchases during the year, this growth was less robust than the 4.7 percent growth in 1977. The decline in this rate of growth particularly reflects slower growth in durable goods real expenditures, which grew at approximately 5 percent, as compared to more than 9 percent in 1977. The specific sub-category of durable goods responsible was motor vehicle purchases, which grew at a rate of just under 3 percent in 1978, rather than the unsustainable rate of 10.5 percent that was recorded for 1977.

As a contrast, it is interesting that in the case of both the remaining major categories of consumer expenditures—Services and Nondurable Goods—the rate of

FIGURE 4. UNITED STATES PERSONAL CONSUMPTION EXPENDITURES
(Billions of 1972 Dollars)


1974 Total = 759.1
Other Durables = 17.4
Furniture & Household Equipment = 50.5
Motor Vehicles & Parts = 44.4
Other Nondurables = 67.2
Fuels = 29.8
Clothing & Shoes = 58.9
Food = 147.5
Other Services = 143.2
Transportation = 28.8
Household Expenses = 48.3
Housing = 123.3
1978 Total = 891.7
Other Durables = 22.6
Furniture & Household Equipment = 60.4
Motor Vehicles & Parts = 61.7
Other Nondurables = 69.4
Fuels = 34.0
Clothing & Shoes = 70.9
Food = 165.4
Other Services = 168.5
Transportation = 34.1
Household Expenses = 58.2
Housing = 146.6

SOURCE: National Income and Product Tables, *Survey of Current Business.*

growth of real expenditures in 1978 was approximately the same as in 1977. Real nondurable goods expenditures grew at the rate of 3.2 percent in 1977 and 2.8 percent in 1978. Real expenditures for services grew at the rate of 4.4 percent in 1977 and 4.6 percent in 1978. However, there is only one sub-category of real nondurable goods expenditures which grew at a rate of less than 4.5 percent; the volume of food purchases increased by only 0.2 percent, apparently reflecting consumer reaction to higher food prices.

The year-to-year rates of growth in the components of real personal consumption expenditures for the past four years are shown in Table 1. This table indicates that with the exception of three categories–the most important two of which are Food and Motor Vehicles–consumer purchases increased at a rate that, on average, exceeded 4.5 percent in 1978. Furthermore, the table provides some evidence of acceleration in particular categories of consumer expenditures, principally nondurables except for food. At the same time, it should be noted also that the decline in the rate for durables expenditures in 1978 reflects a slower increase in real expenditures for Furniture and Fixtures, as well as for Motor Vehicles.

Consumer expenditures provided support for the economy's growth in 1978, but some of these purchases appear to have been made in anticipation of further price increases. Historically, it has been characteristic of the U.S. consumer that he has tended to reduce the volume of his purchases in the face of accelerated inflation rates. Therefore, the evidence that exists of consumer buying in anticipation of future price increases is a worrying feature of his behavior in 1978, particularly as one of the effects of such consumer expenditures may be to help to increase the rate of inflation.

That the consumer responded to the accelerated inflation of 1978 by increasing his rate of purchases beyond a sustainable rate could be indicated by the low savings rate of 5.3 percent for the year and, even more, by the decline in this rate to a seasonally adjusted 4.3 percent in the fourth quarter. The percentage of aggregate disposable income not spent–known as the "savings rate"–has averaged about 6.7 percent annually for the past ten years. During the 1970 to 1975 period, with the exception of 1972, it generally stayed in the range from 7.3 to 7.5 percent. However, in 1976, it fell to 5.7 percent and, in 1977, it fell further to 5.1 percent.

It is easy to make the case that the consumer adopted a new pattern of behavior in the face of the higher rates of inflation in 1978. It is true, for example, that during the past year the consumer was willing to increase his level of installment debt. It is also true that during the past three years, spending for durable goods has been approximately 10 percent of the Gross National Product. In contrast, at the comparable stage of earlier postwar economic recoveries, this percentage tended to be in the neighborhood of 7.5 percent.

However, for perspective, it must be recognized that

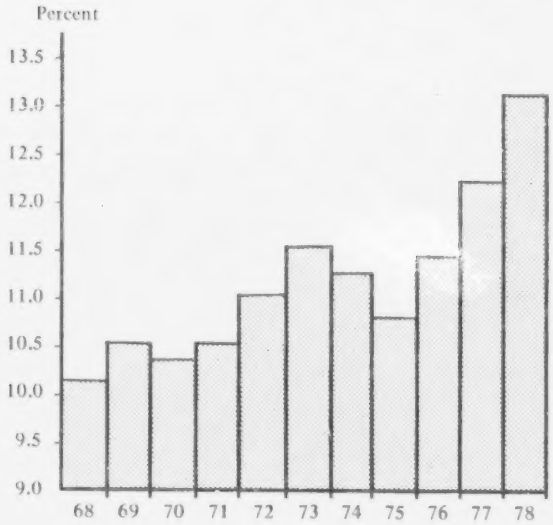
TABLE 1

U.S. PERSONAL CONSUMPTION EXPENDITURES IN CONSTANT DOLLARS
ANNUAL RATES OF GROWTH–PERCENT

| | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|
| Personal Consumption Expenditures | 1.82 | 5.78 | 4.67 | 3.96 |
| Durable Goods | 0.18 | 11.71 | 9.45 | 4.93 |
| Motor Vehicles | 0.90 | 21.21 | 10.50 | 2.83 |
| Furniture and Household Equipment | -1.58 | 6.01 | 8.89 | 4.86 |
| Other Durable Goods | 3.45 | 3.89 | 8.02 | 11.90 |
| Nondurable Goods | 0.89 | 4.44 | 3.19 | 2.78 |
| Food | 2.43 | 4.82 | 3.97 | 0.18 |
| Clothing and Shoes | 3.89 | 4.56 | 3.74 | 6.45 |
| Gasoline and Oil | 1.63 | 4.00 | 2.31 | 5.64 |
| Fuel Oil and Coal | 0.00 | 11.54 | -3.45 | 5.36 |
| Other Nondurable Goods | -5.22 | 2.99 | 1.53 | 4.52 |
| Services | 3.19 | 5.04 | 4.37 | 4.60 |
| Housing | 4.21 | 4.66 | 4.16 | 4.50 |
| Household Operation | 4.56 | 4.56 | 5.12 | 5.05 |
| Electric and Gas | 5.58 | 2.88 | 4.67 | 4.46 |
| Other | 3.86 | 5.41 | 5.77 | 5.45 |
| Transportation | 0.70 | 2.44 | 4.76 | 10.71 |
| Other Services | 2.36 | 5.97 | 4.22 | 3.43 |

SOURCE: National Income and Product Tables, *Survey of Current Business*.

FIGURE 5. CONSUMER INSTALLMENT DEBT: PERCENT OF GROSS NATIONAL PRODUCT 1968-78




SOURCE: *Federal Reserve Bulletin.*

in the past few years, there has been a proportionately larger number of young households, reflecting the population bulge in the 25 to 35 year age group. This is precisely the age group which, as households, can be expected to spend in excess of current earnings, and therefore to undertake installment debt; these households also can be expected to spend a relatively higher proportion of their incomes on consumer durables. Furthermore, the federal tax changes in the 1970s have tended to provide relief for low and middle income consumers, who might have a particular propensity to spend a significant proportion of the increase in after tax income on consumer durables.

This is not to say that there was no consumer hedge buying in 1978. The consumer expenditure surveys undertaken in 1978 indicate that, to some degree, the consumer was purchasing in anticipation of future price increases.[2] But it is not necessarily true that the savings rate and higher proportionate expenditures on consumer durables in 1978 indicate a fundamental change in the pattern of individual consumer's behavior, in the sense that the consumer was panicked into seriously overextending himself in order to buy.[3] The demographic changes that have occurred explain recent consumer expenditure behavior, at least in part. Another important consideration is the decline in the unemployment rate over the year, as well as the substantial increase in employment, which may have provided the consumer some assurance that he could safely buy, without the risk of an imminent loss of job.

## Residential Construction

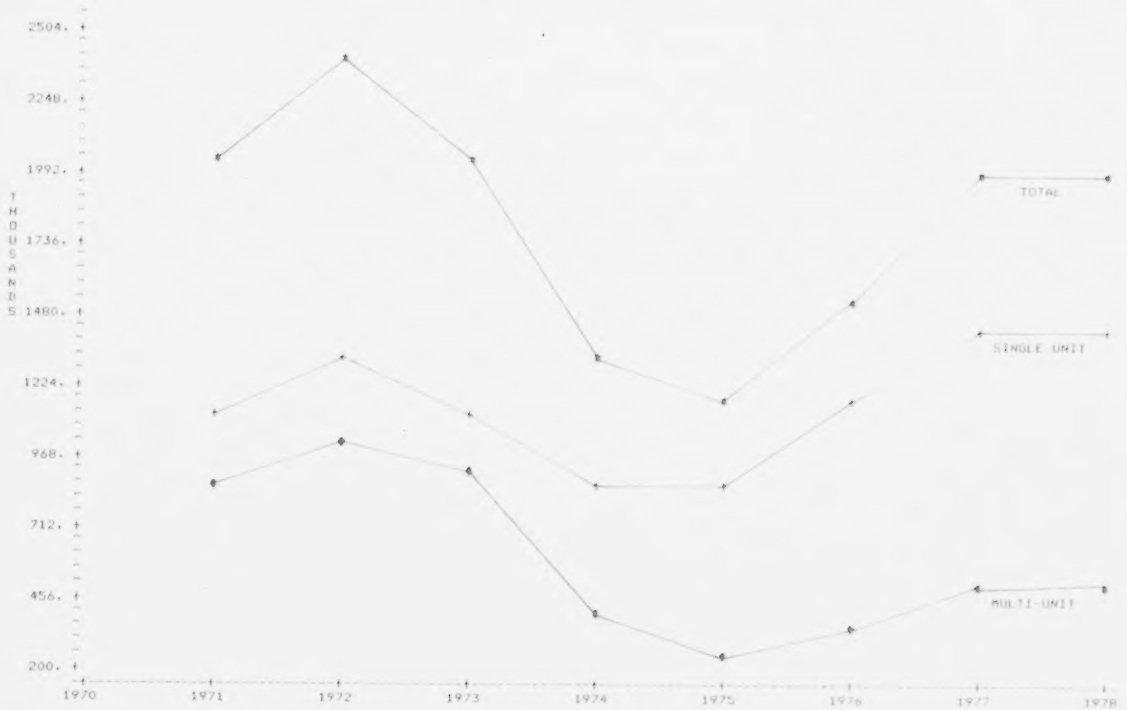
There is, however, one type of expenditure which does appear to have been quite strongly influenced by inflation psychology in 1978. The average price of a house rose approximately 20 percent during the year, but the demand for houses continued to show signs of strength notwithstanding the large price rises and that mortgage rates of interest were generally in excess of 10 percent.

Housebuying is commonly thought of as an expression of consumer demand, particularly as the purchase of a house is usually made by a consumer. However, it is not recorded in the National Income and Product Accounts as a consumer expenditure and it is therefore treated as a separate category here. This treatment carries with it important implications. Specifically, the sale of an existing house represents simply the transfer of an asset between individual economic agents, apart from any realtor's commission. Such a sale is therefore excluded from the accounts because it does not represent the production of either new goods or services. In contrast, the purchase of a newly built house does appear in these accounts, apart from the value of the land, but as a component of Business Investment. It is the construction of the house rather than the purchase which is emphasized in the national accounts. An important consequence of this accounting convention is that a surge in housebuying, because it does not appear in the accounts as a consumer expenditure, does not result in a decline in the savings rate.[4] It is only indirectly, as a stimulus to the purchase of household fixtures and appliances, that housebuying could have the effect of reducing this ratio.

In 1978, for the second year in a row, Housing Starts remained at a level in excess of 2 million units for the year. Early in 1978, because of weather conditions, the rate slipped below this figure; however, it rebounded immediately with the spring thaw. Single family starts, at 1.4 million units, were essentially the same as in 1977. Multifamily starts, although below the levels reached in the 1970s, were up about 10 percent from 1977, at a rate of approximately 600 thousand units.

A rate of 1.4 million units for single family starts is unusually high for the fourth year of a recovery. This rate reflects the strong rate of sales of new homes and the rapid increase in the price of houses, which is a signal to builders to increase the supply. To some degree at least, these conditions in turn reflect the existing proportion of young households in the population. However, the strong demand for houses appears to be even more a consequence of two circumstances in particular. First, the widespread belief that a house represents the consumer's best investment; over the past

FIGURE 6. PRIVATE HOUSING STARTS-ANNUAL




SOURCE: SURVEY OF CURRENT BUSINESS, KENTUCKY ECONOMIC INFORMATION SYSTEM

decade, with the price increases that have occurred, a house has yielded as high a rate of return as almost any other possible consumer asset. Secondly, the general expectation is that house prices will continue to increase, possibly at a rapid rate.

Of course, the desire to purchase is not sufficient. But, in 1978, there was also the ability to purchase, which was a result not only of the growth in multiple earner families, but also certain changes in financial institutions. Historically, home building has been "crowded out" in the advanced stages of a recovery. In the past, because of fixed legal interest rate ceilings, savings and loans and other mortgage lenders have been limited in their ability to compete for funds with banks and other institutions. As interest rates began to rise, reflecting a growing general demand for funds on the part of business and government, the result was a rapid outflow of funds from thrift institutions, and a consequent shortage of money for mortgages.

However, the recent introduction of new, variable rate securities by mortgage institutions has resulted in a fundamental change in the ability of these institutions to compete for funds. These securities, which are pegged to the Treasury Bill rate, have been available since June 1978. In 1978 there was only about a 10 percent decline in thrift institutions' net mortgage holdings. Furthermore, this decline was largely offset by increased mortgage lending by commercial banks and government-linked lenders, as well as by the issuance of pass through mortgage securities.[5] As a consequence, over all, there was little or no decline in residential mortgage debt formation in 1978 from the record level achieved in 1977.

The strength in single family housing units helped to erode some of the support for multifamily housing in 1978; an increase in the proportion of the population likely to purchase single family homes implies a relative decline in the proportion likely to buy multifamily units. However, in addition, strength in multifamily units generally depends upon the expected profitability of rentals. Rent increases have remained moderate in comparison to the rise in operating costs. Furthermore, the degree of weakness in the multifamily sector was masked to some extent by an increase in federal participation in multifamily construction. In 1978, there was an increase in subsidized rental units under the HUD Section 8 program. This type of unit accounted for approximately a quarter of all multifamily units constructed in 1978, as compared with about 18 percent in 1977.[6]

## Business Nonresidential Investment

Business Investment includes not only residential construction, but also business expenditures for plant and durable equipment. In 1978, real business expenditures for plant and durable equipment finally exceeded the peak previously reached in 1973. It is unusual that it should have taken so long for this to occur, since such an event typically occurs after an average of six quarters of recovery. However, that it took the time it did is illustrative of the lack of business confidence which has been the hallmark of this recovery.[7]

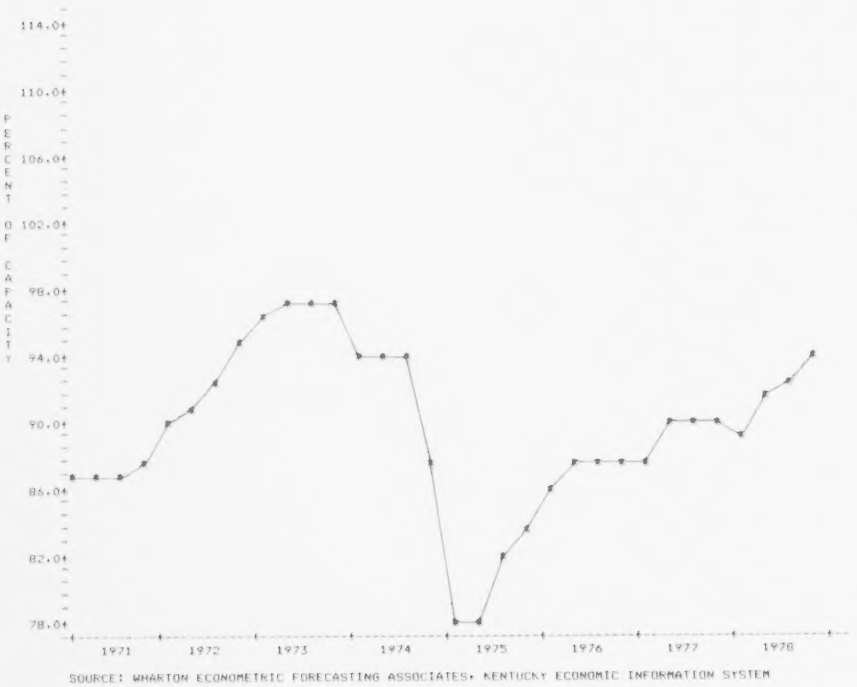
Business spending for plant and durable equipment follows in a recovery, rather than leading it, for the simple reason that there is normally considerable idle capacity at a recession trough. Therefore, in the early stages of a recovery, it is usual for businessmen to adopt a wait-and-see attitude as they attempt to gauge the strength and longevity of the expansion. However, it is also usual, once the recovery has shown itself to be firmly established, that some investment will be undertaken in anticipation of future levels of business activity.

There is little evidence in the investment behavior of businessmen since the spring of 1975 that anticipation has been a very strong motivating force. At least until the end of 1978, inventory accumulation—a component of business investment—was kept firmly in check. Throughout the recovery, from the spring of 1975 to the end of 1978, inventory-sales ratios remained low by historical standards. In the few instances that this ratio tended to rise, the bulge in inventories was not allowed to remain longer than one or two quarters. Similarly, expenditures for plant and equipment have not been noticeably responsive either to accommodating monetary policies or to increasing profits. Nor have they been very responsive to evidence of strong consumer demand, until perhaps recently.

For the past three years, including 1978, the rate of growth of real business expenditures for plant and durable equipment has averaged just over 8 percent, with very little variation in the year-to-year figures. This rate of increase is not excessively low, but in 1976, for example, such a rate must be viewed against a background of progressively more accommodating monetary policy, declining interest rates and increasing profits.

If the carrot proved to be ineffective, the stick also has not had a dramatic effect. In 1978, monetary policy became somewhat restrictive, but the coincident slowing in the rate of increase of plant and durable equipment expenditures was only about a percentage point. Moreover, not only did interest rates rise during the year, there were increases in equity dividend-price ratios and a slowing in the rate of increase in real final

FIGURE 7. INDUSTRIAL CAPACITY UTILIZED PER QUARTER




SOURCE: WHARTON ECONOMETRIC FORECASTING ASSOCIATES, KENTUCKY ECONOMIC INFORMATION SYSTEM

sales, from 4.7 percent in 1977 to 3.9 percent in 1978. However, as shown in Figure 7, the effect of these unfavorable developments appears to have been offset by an upward movement in the rates of capacity utilization. Apparently, in 1978, the need for capacity, rather than anticipation, motivated capital spending.

The compositional change in investment expenditures between 1978 and earlier years is further evidence of the cautious attitude of businessmen. Only recently has the composition shifted noticeably toward expenditures for long-lasting items, in preference to the shorter lived. In 1978, real machinery expenditures grew at approximately the same rate as 1977. Motor vehicle expenditures declined, thus slowing the rate of increase of producer durable equipment real expenditures from the 10 percent of the previous two years to 6.7 percent in 1978. However, in 1978, real expenditures for structures increased at a rate of more than 11 percent, as compared to about 4.5 percent the year before.

## Foreign Trade

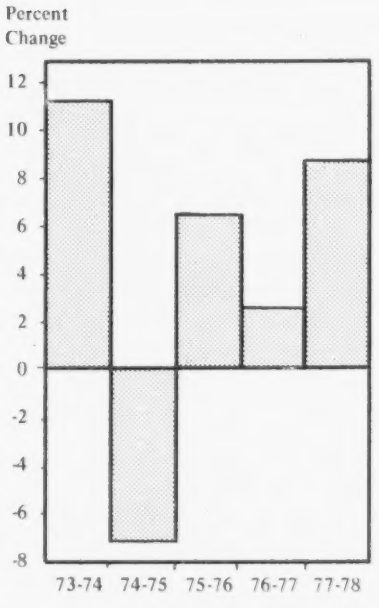
Foreign Trade, and exports in particular, represents another source of demand for U.S. produced goods and services. At first glance, 1978 bears the marks of having been a bad year for the U.S. economy with respect to foreign trade. Not only was the dollar buffeted on the foreign exchanges, but the trade balance was a negative $12 billion for the year, a larger deficit than the $11.1 deficit of 1977.[8] Furthermore, the growth rate of imports exceeded the rate of growth of exports, measured in terms of volume, leading to a $1.1 billion decrease in real Net Exports from $9.5 billion in 1977 to $8.4 billion in 1978.[9]

Appearances can be deceiving, however, for in terms of the implications for the future the most significant trade development of the year was not the greater trade deficit, nor even the higher rate of growth in the volume of imports. Instead, it was that the volume of exports grew at a rate of nearly 9 percent. This rate of growth is substantially higher than the average annual rate during the previous two years, as shown in Figure 8.

In order to obtain a perspective on the export growth in 1978, it is useful to consider the reasons for sluggish U.S. export growth in 1976 and 1977. Several of these relate to the relative performance of the U.S. economy and other economies during the 1975 to 1977 period. During this period, not only did the U.S. economy grow at a rate in excess of its long-term potential growth rate, it grew at a rate in excess of the average recovery rate in earlier postwar expansions. In contrast, during this time, other advanced industrial economies experienced growth rates below both their historical recovery rates and their long-term potential growth rates.

One effect of the rapid rate of economic growth in

FIGURE 8. U.S. EXPORTS: PERCENTAGE CHANGE FROM PRECEDING PERIOD
(Billions of 1972 Dollars)




SOURCE: National Income and Product Tables, *Survey of Current Business*.

the United States, in comparison with the slow rates of growth elsewhere, was that the United States became a more attractive market in which to sell, for American as well as foreign sellers. The result was less incentive to U.S. firms to export and greater incentive to import.

However, it is not simply that the U.S. provided a more attractive market. The world demand for particular types of goods and services weakened during the 1975 to 1977 period. For example, the slower rate of recovery of other advanced industrial economies resulted in a lower rate of capital spending in these economies than if the growth had been faster. Since investment goods and associated services account for approximately a third of U.S. exports, the lower rates of growth of investment abroad had a significant impact on the volume of U.S. foreign sales. Similarly, the slower rate of economic expansion abroad, coupled with harvests worldwide that were at least adequate in most instances, helped to retard foreign sales of agricultural goods, another major category of U.S. exports.

In addition, particular countries that are important U.S. trading partners exhibited abnormally weak import demand, even once the effects of their rates of economic growth are taken into account. In the period since 1965, two countries, Canada and Japan, have purchased almost

TABLE 2

PERCENT CHANGE IN SELECTED COUNTRIES' IMPORT VOLUME[1]

| Country | 1974-75 | 1975-76 | 1976-77 | 1977-78 |
|---|---|---|---|---|
| United States | -4.3 | 25.3 | 21.6 | 16.2 |
| Canada | 5.5 | 10.9 | 4.3 | 9.7 |
| Japan | -6.9 | 12.2 | 9.9 | 12.0 |
| France | 2.0 | 19.3 | 9.5 | 16.0 |
| Germany | 7.7 | 18.0 | 14.8 | 20.0 |
| Italy | -6.6 | 13.2 | 10.7 | 17.2 |
| United Kingdom | -0.1 | 3.8 | 14.0 | 21.7 |

[1]Import volume measured in current United States dollars.

SOURCE: *International Financial Statistics*, International Monetary Fund.

a third of U.S. exports. However, during 1975 to 1977, both these countries exhibited a diminished propensity to import; that is, even taking into account their slower rates of economic growth by considering imports as a proportion of national income, these countries exhibited a lower than normal import demand during the period.

Finally, there is the matter of the price competition of U.S. exports. During the period from 1975 to 1977, not only was there sluggish growth in U.S. exports, but the U.S. share of world trade declined. Note, in Table 3, that between 1975 and 1977 this share declined from over 15 percent to about 13.5 percent. The several circumstances just considered no doubt played an important part in bringing about this decline, but there was also a significant degree of deterioration in the price competitiveness of U.S. exports, particularly between 1974 and 1976.

TABLE 3

SELECTED COUNTRIES' AVERAGE WORLD MARKET SHARE[1]
(Percent)

| Country | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|
| United States | 14.6 | 15.6 | 14.5 | 13.4 | 14.5 |
| Canada | 4.7 | 4.5 | 4.7 | 4.4 | 4.4 |
| Japan | 7.7 | 7.5 | 8.0 | 8.6 | 9.5 |
| France | 6.4 | 7.1 | 6.7 | 6.8 | 7.5 |
| Germany | 13.1 | 12.8 | 12.7 | 13.0 | 14.4 |
| Italy | 5.4 | 5.9 | 5.4 | 6.0 | 6.8 |
| United Kingdom | 4.1 | 4.6 | 4.3 | 4.6 | 5.2 |

[1]Average market share equals each country's export volume divided by world export volume less that country's export volume.

SOURCE: *International Financial Statistics*, International Monetary Fund.

The stronger export performance of the U.S. economy in 1978 reflects that, to some degree, there has been a reversal in the situation that prevailed during the 1974 to 1977 period. For instance, there has been an improvement in the relative performance of other economies. This improvement is a consequence of the somewhat less robust performance of the U.S. economy in 1978 than in 1976 and 1977, but it is due also to the stronger performance of the European economies particularly. These economies have become relatively more attractive as markets to American and foreign sellers alike, and in these economies the demand for capital goods has strengthened. U.S. export gains in 1978 were particularly noticeable in the case of such items as aircraft, industrial supplies, and machinery.[10]

In addition, however, there was also stronger demand for U.S. agricultural exports in 1978, especially on the part of South American countries. This demand was stimulated by poor harvests of wheat and soybeans in this part of the world. In constant dollars, U.S. agricultural exports increased at the rate of 20 percent in 1978.

Furthermore, beginning in 1976, there has been improvement in U.S. export price competitiveness. This is a consequence of the devaluation of the dollar relative to other currencies. However, for a variety of reasons, such improvement in price competitiveness was not immediately translated into an increase in exports, nor has it been fully reflected in decreased imports. One reason is that it generally takes time for price changes to lead to perceptible changes in world trade patterns. A period of adjustment particularly seems to be required whenever exchange rate movements are the source of the price changes, especially if there is considerable uncertainty about the permanence of the new exchange rates. Nevertheless, there was a pronounced slowing in the growth of non-oil imports in 1978, compared to 1976 and 1977, in part because of the higher relative price of foreign imports.

There was also a decline in U.S. oil imports of about a half million barrels a day in 1978, reflecting increased production of Alaskan oil and some stock drawdowns. But unlike most other imports, oil is generally priced in dollars worldwide. Consequently, there was no exchange rate effect on the price of oil. In fact, because of the moratorium on price changes by the OPEC countries, the price of U.S. oil imports was virtually unchanged in 1978.

## Government

Government Expenditures is the remaining category of aggregate national demand. In 1978, the rate of growth of combined federal and state and local government real expenditures decreased slightly to 2.2 percent from 2.4 percent in 1977. This decline in the rate of

growth was the net effect of an outright reduction in federal government expenditures and a fairly healthy increase in state and local government expenditures. Federal government real expenditures declined by 1.3 percent. State and local government real expenditures increased at the rate of 4.2 percent.

Between 1977 and 1978, there was also a decline in the federal government budget deficit, which on a NIA basis shrank by about $17 billion, to just under $30 billion. This decrease in the deficit was a result of several circumstances. In 1978, there was a rapid rise in tax receipts, which grew by about 14 percent, a larger rate of increase than in either of the previous two years. The growth in tax receipts was in part due to the increase in incomes, which had the effect of raising taxpayers into higher marginal tax brackets. However, the rise in the taxable wage base and in certain effective tax rates for social insurance contributions, together with the income growth which occurred, had the effect of causing an increase of nearly 17 percent in total contrbituions for social insurance.

At the state and local government level, there was a decline in the surplus, net of social insurance trust balances, from about $11 billion in 1977 to just over $7 billion in 1978. At least in part, this decline reflected the passage of Proposition 13 in California and similar tax-cutting legislation elsewhere. At the same time, because of the increases in particular effective tax rates and in taxable wage base for unemployment insurance contributions, and because of some decline in benefits paid, there was a net growth in the total trust fund balance that nearly offset the reduced surplus elsewhere.

## Employment, Unemployment and Productivity

There is a close, almost obvious relationship between economic growth and an increase in employment. In 1978, employment grew at a year-to-year rate in excess of 4 percent. This growth represents the creation of about 3.8 million new jobs, a surprisingly high figure at this stage of the recovery. As mentioned earlier, a consequence of this employment growth was a full percentage point decline in the unemployment rate and an employment-population ratio of nearly 60 percent.

The growth in employment was experienced generally. However, particular industries and population cohorts were relatively more favored than others. The manufacturing and construction industries experienced substantial employment increases. Adult women accounted for a disproportionate share of the new jobs. Generally, it was unskilled workers who experienced the greater employment increases, although this partially reflects the existence of a skilled worker shortage.

However, a particular feature of the current recovery is not only that significant increases in employment have been recorded, even in the fourth year, but also that there was a relatively early decline in labor productivity. Normally, the increase in output per man-hour diminishes noticeably in the later stages of recovery, reflecting labor market conditions and capacity constraints which begin to be encountered. But in the current recovery, this decline in the growth rate of productivity occurred much earlier.

Various explanations have been advanced to explain this decline. It has been argued that the increased participation rates of women and young workers implies a work force that is, on average, less experienced than in past years. Since 1970, new work safety and environmental protection regulations have been imposed. These regulations may have had a direct impact, but their being in force also has had an effect on capital spending. A significant proportion of business investment expenditures during the past decade appears to have been on plant and equipment mandated by these regulations. Furthermore, it is possible to argue that the increased cost of energy has resulted in a shift towards more labor-intensive production techniques, thus tending to decrease output per man-hour.

Since increases in productivity help to offset increases in the cost of production and, thus, help to moderate "cost-push" inflation, the lower rates of productivity increase in 1977 and 1978, particularly, have had inflationary consequences. The combination of tightening labor markets, particularly for skilled workers, and low rates of productivity growth resulted in increased cost pressures in 1978.

## The Economic Outlook 1979-80

There is not yet sufficient evidence on the economy's performance in early 1979 to be certain, but it appears that during the first part of the year, the economy may have been in transition. The more than 6 percent growth which occurred in the fourth quarter of 1978 was due, in particular, to increased real spending on the part of both businesses and consumers. Real consumption expenditures for durable and nondurable goods increased at an annual rate in excess of 11.5 percent, with durable goods expenditures showing the greatest gain. Business real expenditures for plant and durable equipment increased at an annual rate of 9.5 percent. In addition, exports provided strong year-end support, increasing in volume at an annual rate of more than 10 percent.

However, while consumer expenditures for some motor vehicles may continue to increase at a rapid rate—chiefly as a consequence of fears about the availability gasoline—the economy's growth in the early part of 1979 is likely to reflect principally a further increase in

nonresidential real business expenditures and continued growth in the volume of exports. Nonresidential business investment expenditures should be stimulated by the continuing high rates of capacity utilization that are now being experienced. Furthermore, there is some evidence that not only are businessmen in the mood to spend for plant and equipment, they are at last beginning to build inventories.

Were it not for the fact of a higher rate of inflation, a weak dollar, and a variety of other danger signals, such strength in business spending could augur well for a continued recovery. It is true, of course, that in the early months of 1979, residential construction has begun to show signs of an impending decline which reflects more than just weather conditions. However, at this stage of recovery, it is less surprising that housing should show such weakness than that it continued to show strength for so long. Notwithstanding the danger flags now waving, the economy appears to be moving into the usual mature phase of the recovery, when plant and equipment take up the slack left by residential construction.

There is, however, an alternative interpretation of the developments in early 1979. From initial reports on retail sales, it appears that the rate of growth of real consumer expenditures has decreased and that, correspondingly, the savings ratio has risen. Furthermore, if the increased rate of business inventory accumulation and the stronger demand for raw materials are interpreted not as representing business commitment, but rather as a reaction to supply uncertainties and other unsettled conditions, then it is possible to interpret this spending as adding to the risk of recession. The probability of recession is also increased by the twin circumstances of a restrictive monetary policy stance by the Federal Reserve Board, characterized by high interest rates, and fiscal policy in the wake of Proposition 13 which may become increasingly more conservative. Particularly to the degree that the behavior of business can be seen as being characteristic of a speculative boom, this alternative interpretation not only suggests the increased likelihood of recession during the next two years, it also implies a more severe one.

## Wharton Model Quarterly Forecast 1979-80

A quantitative assessment of the economic outlook is provided in Appendix Table A-1. This is a forecast made by Wharton Econometric Forecasting Associates using the Wharton Mark V Quarterly Econometric Model of the United States. The forecast is based upon a number of assumptions, the most important of which are:

1. An adjustment to take into account the effects of the Iranian export shutdown. Specifically, for 1979, the effective oil price has been increased 15 percent above the December 1978 OPEC posted prices, the increase to take effect beginning in the second quarter of 1979. For 1980, effective prices are assumed to increase 5 percent each six months.
2. No tax cut in 1980; however, the provisions of the 1979 tax cut bill have been taken into account.
3. Federal Expenditure and Revenue assumptions as defined in Appendix Table A-2. Note, in particular, that stronger growth in federal grants-in-aid to state and local governments is assumed than that included in the Administration's proposed budget.
4. Allowances for the anticipated effects of the 1978 energy legislation.

The forecast indicates a slower rate of growth in real Gross National Product in 1979 than in 1978, with the rate of growth decreasing to less than 2 percent in 1980. However, while the forecast indicates negligible quarter-to-quarter growth in the second and third quarters of 1979, there is no recession predicted during the 1979-80 period nor even one quarter for which there is negative growth. The forecast is characterized by a higher rate of inflation in 1979 than in 1978, in terms of all three measures of inflation shown: the Gross National Product deflator, the Consumer Price Index and the Producer Price Index. However, by 1980, there is some decline in the rate of inflation, although the decline is slight. This forecast shows interest rates maintained at levels throughout the forecast period that are high by historical standards and it indicates a relatively moderate rise in the unemployment rate throughout 1979 and 1980.

Clearly, of the two interpretations of the current economic situation just presented, the Wharton forecast embodies the first. It is also evident that this forecast illustrates an optimistic result. Compared to many others, this forecast is optimistic both in the sense that it does not predict recession and in the sense that what it predicts represents a best possible outcome under the circumstances: taking into account both inflation and economic growth, and the trade-off between them, it is unlikely that the economy will perform appreciably better during this period than is indicated by the forecast.

The possibility of recession has received considerable attention. However, the fact that this Wharton forecast does not predict at least two quarters of negative growth is less significant than that the forecast does suggest a *near* recession. The forecast takes into account, in its assumptions about fiscal and monetary policy, that 1980 is an election year. An implication of the forecast is that a more conservative set of fiscal policies and/or a more restrictive monetary policy than that assumed could easily throttle the economy down to the point of outright recession. An inference that can be drawn is that the economy is vunerable and that the particular pattern of the economy's performance during the next

two years will be determined to a significant degree by the economic policies that are pursued.

However, it is not only the probability of recession which deserves attention. At present, except for high unemployment among youths, the economy is at or very near the point of full resource utilization. As mentioned earlier, the ratio of employment to population is high. Capacity utilization in manufacturing, particularly, is at near peak levels. There is some evidence of a potential shortage of certain raw materials. Furthermore, there is general uncertainty about fuel supplies and some fear on the part of businessmen that price controls will be imposed, notwithstanding Administration disclaimers. In the absence of recession, these conditions threaten an increased rate of price inflation. In the absence of recession the strength of demand could result in an extended period of double digit inflation, very possibly resulting in a period of speculative boom followed by a severe recession, as occurred in 1974.

Therefore, as suggested in the introduction to this chapter, a "soft landing" strategy represents the best hope. The Wharton forecast illustrates that it may be possible to obtain such a result. However, surefootedness is the order of the day.

### Footnotes

[1]See Julius Shiskin, "A New Role for Economic Indicators," *Monthly Labor Review*, November 1977, pp. 3-5.

[2]See, for example, the regular reports on consumer sentiment published in *Economic Outlook USA*, a quarterly publication of the Survey Research Center, Institute of Social Research, University of Michigan.

[3]For an alternative view, see Edward Meadows, "The Unhealthy Glow on Retail Sales," *Fortune*, July 3, 1978, pp. 46-48.

[4]In fact, to the extent that housebuying leads to an increase in the market value and, hence, imputed rental value of housing, which is a component of Personal Income, the effect could conceivably be a rise in the savings ratio. For a description of the components of Personal Income, see Charles G. Renfro and Paul A. Coomes, *The Kentucky Economic Information System User Manual* (Lexington, Kentucky: Office for Research, College of Business and Economics, University of Kentucky, 1977), Section 2.3.

[5]See Sherry S. Atkinson, "Nonbank Thrift Institutions in 1977 and 1978," *Federal Reserve Bulletin*, December 1978, pp. 927-936. For an historical review of mortgage interest rate ceilings see Edward F. McKelvey, "Interest Rate Ceilings and Disintermediation." Federal Reserve Board staff study prepared in April 1978 for the Administration's Task Force on Deposit Interest Rate Ceilings and Housing Credit, which is abstracted in the *Federal Reserve Bulletin*, September 1978, pp. 715-716.

[6]However, it should be noted that as a result of changes in the U.S. income tax laws, as enacted in 1976, accelerated depreciation is now available only on units built under Section 8 of the U.S. Housing Act of 1937, as amended. This tax law change may account for some of the increased activity in "public" multifamily starts.

[7]See Charles Renfro, "The National Economic Situation," *Kentucky Council of Economic Advisors Annual Report 1977*, pp. 1-22, for a description of business expenditures behavior in 1975 through 1976.

[8]Note that the trade balance referred to is on a National Income and Product Accounts basis, as published in the *Survey of Current Business*.

[9]Real Net Exports are positive, despite the current dollar trade deficit principally because of the fact that 1972 is the base year for real dollar measurements.

[10]See "U.S. Share of Foreign Countries Imports Continues to Decline," Quarterly World Market Report in *Business America: The Journal of Industry and Trade*, December 4, 1978, Vol. 1, No. 4.

# APPENDIX

# WHARTON ECONOMETRIC FORECAST

# AND ASSUMPTIONS

TABLE A-1

WHARTON QUARTERLY ECONOMETRIC MODEL
SELECTED MAJOR ECONOMIC INDICATORS

| Item | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Gross National Product | 2280.2 | 2324.3 | 2364.1 | 2420.4 | 2471.4 | 2529.8 | 2581.5 | 2637.5 | 2106.9 | 2347.3 | 2555.0 |
| Percent Change | 12.89 | 7.97 | 7.02 | 9.88 | 8.69 | 9.80 | 8.44 | 8.95 | 11.64 | 11.41 | 8.85 |
| Real Gross National Product | 1424.9 | 1427.9 | 1429.8 | 1436.6 | 1443.6 | 1450.5 | 1459.4 | 1463.3 | 1385.3 | 1429.8 | 1454.2 |
| Percent Change | 3.42 | 0.83 | 0.53 | 1.92 | 1.95 | 1.95 | 2.46 | 1.08 | 3.95 | 3.21 | 1.71 |
| Implicit Price Deflator | 160.0 | 162.8 | 165.3 | 168.5 | 171.2 | 174.4 | 176.9 | 180.2 | 152.0 | 164.2 | 175.7 |
| Percent Change | 9.16 | 7.09 | 6.46 | 7.80 | 6.61 | 7.70 | 5.83 | 7.79 | 7.39 | 7.97 | 7.02 |
| Percent Change Consumer Price Index | 10.63 | 9.22 | 8.32 | 8.35 | 8.04 | 9.04 | 6.94 | 8.83 | 7.60 | 9.24 | 8.30 |
| Percent Change Wholesale Price Index | 12.96 | 9.62 | 8.34 | 9.75 | 8.69 | 11.47 | 6.91 | 10.98 | 7.77 | 10.26 | 9.34 |
| Personal Income | 1834.0 | 1879.4 | 1931.7 | 1982.0 | 2024.4 | 2073.9 | 2125.0 | 2176.2 | 1707.6 | 1906.8 | 2099.9 |
| Total Civilian Employment | 96.22 | 96.73 | 97.25 | 97.59 | 98.01 | 98.28 | 98.66 | 98.87 | 94.38 | 96.95 | 98.46 |
| Non-Ag Wage & Salary Employment | 92.96 | 93.53 | 94.06 | 94.43 | 94.88 | 95.18 | 95.58 | 95.82 | 91.04 | 93.75 | 95.36 |
| Manufacturing | 20.83 | 21.01 | 21.11 | 21.19 | 21.26 | 21.33 | 21.40 | 21.45 | 20.33 | 21.04 | 21.36 |
| Durable Goods | 12.54 | 12.64 | 12.68 | 12.72 | 12.77 | 12.81 | 12.86 | 12.89 | 12.16 | 12.65 | 12.83 |
| Nondurable Goods | 8.29 | 8.37 | 8.43 | 8.47 | 8.49 | 8.52 | 8.54 | 8.56 | 8.17 | 8.39 | 8.53 |
| Total Civilian Labor Force | 102.29 | 102.97 | 103.62 | 104.20 | 104.86 | 105.41 | 105.92 | 106.41 | 100.42 | 103.27 | 105.65 |
| Total U.S. Population | 219.7 | 220.2 | 220.6 | 221.1 | 221.6 | 222.1 | 222.6 | 223.1 | 218.5 | 220.4 | 222.4 |
| Federal Reserve Board Industrial Production Index | 151.6 | 153.4 | 154.0 | 154.5 | 155.2 | 156.0 | 157.0 | 157.7 | 145.0 | 153.4 | 156.5 |
| Percent Change | 5.67 | 4.62 | 1.69 | 1.17 | 1.88 | 2.22 | 2.51 | 1.81 | 5.82 | 5.73 | 2.03 |
| Unemployment Rate (Percent) | 5.93 | 6.07 | 6.15 | 6.34 | 6.54 | 6.76 | 6.86 | 7.08 | 6.00 | 6.12 | 6.81 |
| Net Exports (Current Dollars: Billions) | 12.2 | 13.8 | 14.9 | 15.2 | 16.2 | 15.2 | 15.6 | 14.6 | 8.4 | 14.0 | 15.4 |
| Money Supply–$M_1$ | 94.89 | 94.68 | 94.00 | 93.91 | 93.85 | 93.88 | 93.99 | 93.76 | 91.95 | 94.37 | 93.87 |
| Percent Change | 2.80 | -0.89 | -2.84 | -0.38 | -0.22 | 0.11 | 0.45 | -0.97 | 2.72 | 2.63 | -0.53 |
| Corporate Profits Before Tax | 238.8 | 230.7 | 217.5 | 219.5 | 219.7 | 224.8 | 220.8 | 224.4 | 202.7 | 226.6 | 222.4 |

[1] See footnotes at end of Table A-5.

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: March 1, 1979.

TABLE A-2

WHARTON FORECAST ASSUMPTIONS
FEDERAL GOVERNMENT SPENDING AND RECEIPTS
(Billions of Dollars)

| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|---|---|---|
| Federal Government Defense Purchases (GVPFD$) | | | | | | | | |
| Base Assumption | 101.8 | 104.1 | 104.8 | 107.0 | 108.6 | 110.2 | 112.0 | 113.7 |
| Pay Raise | | | | 4.0 | 4.1 | 4.1 | 4.1 | 6.4 |
| October 1978 (5.5%) | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 |
| October 1979 (5.5%) | 1.9 | 1.9 | 1.9 | 2.1 | 2.2 | 2.2 | 2.2 | 2.2 |
| October 1980 (5.5%) | | | | | | | | 2.3 |
| Timing Adjustments | -0.1 | -0.9 | -0.2 | -0.3 | -0.4 | -0.5 | -0.5 | 0.0 |
| Total | 103.6 | 105.1 | 106.5 | 110.7 | 112.3 | 113.8 | 115.6 | 120.1 |
| Federal Government Non-Defense Purchases (GVPFOS) | | | | | | | | |
| Base Assumption | 59.1 | 61.3 | 62.6 | 63.0 | 63.5 | 64.0 | 64.5 | 65.0 |
| Pay Raise | | | | 1.7 | 1.7 | 1.7 | 1.7 | 2.6 |
| October 1978 (5.5%) | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 |
| October 1979 (5.5%) | 0.8 | 0.8 | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| October 1980 (5.5%) | | | | | | | | 0.9 |
| Non-Recourse Loans to Farmers | 1.5 | -2.8 | -0.4 | 0.5 | 0.3 | 0.2 | 0.2 | 0.2 |
| Strategic Petroleum Reserve Purchases | 1.1 | 0.0 | 0.0 | 0.0 | 0.6 | 1.2 | 1.3 | 1.3 |
| Total | 62.3 | 59.3 | 63.0 | 65.2 | 66.1 | 67.1 | 67.7 | 68.9 |
| Federal Government Social Security Benefits (TRGFPSOS) | | | | | | | | |
| Base Assumption | 96.4 | 97.5 | 98.6 | 99.7 | 100.7 | 101.7 | 102.7 | 103.7 |
| Benefit Increase | 0.0 | 0.0 | 9.4 | 9.5 | 9.6 | 9.7 | 19.3 | 19.4 |
| July 1979 (9.5%) | | | 9.4 | 9.5 | 9.6 | 9.7 | 9.8 | 9.9 |
| July 1980 (8.4%) | | | | | | | 9.5 | 9.5 |
| Program Changes | 0.0 | 0.0 | 0.0 | 0.0 | -0.2 | -0.4 | -0.6 | -1.2 |
| Total | 96.4 | 97.5 | 108.0 | 109.2 | 110.1 | 111.0 | 121.4 | 121.9 |
| Federal Government Transfers to Persons-Other (TRGFPOTHERS) | | | | | | | | |
| Base Assumption | 52.7 | 53.5 | 54.4 | 55.2 | 56.1 | 57.0 | 57.9 | 58.8 |
| Earned Income Credit | 0.8 | 0.7 | 1.0 | 1.0 | 1.7 | 1.7 | 1.4 | 1.4 |
| Total | 53.5 | 54.2 | 55.4 | 56.2 | 57.8 | 58.7 | 59.3 | 60.2 |

TABLE A-2 (continued)

| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|---|---|---|
| Federal Subsidies Less Surplus (GVSUBTF$) | | | | | | | | |
| Base Assumption | 7.3 | 7.3 | 7.7 | 7.9 | 8.9 | 8.7 | 9.7 | 10.3 |
| CCC Subsidy | 1.0 | 1.3 | 1.1 | 1.0 | 0.9 | 0.9 | 0.8 | 0.8 |
| Government Transfers to Farmers | 2.7 | 2.3 | 2.0 | 2.5 | 1.9 | 1.5 | 1.3 | 2.5 |
| Total | 11.0 | 10.9 | 10.8 | 11.4 | 11.7 | 11.1 | 11.8 | 13.6 |
| Federal Government Personal Taxes (TXCPF$) | | | | | | | | |
| Base Adjustment | -28.0 | -28.0 | -28.0 | -28.0 | -28.0 | -28.0 | -28.0 | -28.0 |
| Residential Energy Conservation Credit | -1.1 | -1.1 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 | -0.5 |
| Increase Due to Expiration of General Credit | 8.9 | 8.9 | 8.9 | 8.9 | 9.0 | 9.0 | 9.0 | 9.0 |
| Decrease Due to Capital Gains Tax Relief | -0.4 | -0.4 | -0.4 | -0.4 | -2.7 | -2.7 | -2.8 | -2.9 |
| Miscellaneous 1979 Tax Bill Reductions | -0.2 | -0.2 | -0.2 | -0.2 | -0.4 | -0.4 | -0.4 | -0.4 |
| Decrease to Allow for Change in Foreign Earnings Information Act | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 | -0.1 |
| Total | -20.9 | -20.9 | -20.3 | -20.3 | -22.7 | -22.7 | -22.8 | -22.9 |
| Federal Social Insurance Contributions As a Fraction of Salaries and Wages (TXCSFTRES$/WBS$) | | | | | | | | |
| Base Assumption | .0277 | .0277 | .0277 | .0277 | .0277 | .0277 | .0277 | .0277 |
| Scheduled Unemployment Insurance Decrease | -.0004 | -.0004 | -.0004 | -.0004 | -.0004 | -.0004 | -.0004 | -.0004 |
| Total | .0273 | .0273 | .0273 | .0273 | .0273 | .0273 | .0273 | .0273 |
| Federal Government Indirect Business Taxes (TXCBF-O-C$) | | | | | | | | |
| Base Adjustment | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 |
| Scheduled Telephone Excise Tax Reduction | -0.4 | -0.4 | -0.4 | -0.4 | -0.8 | -0.8 | -0.8 | -0.8 |
| Total | 1.2 | 1.2 | 1.2 | 1.2 | 0.8 | 0.8 | 0.8 | 0.8 |

**TABLE A-2 (continued)**

| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|---|---|---|
| Federal Corporate Profits Tax (TXCCF$) | | | | | | | | |
| Base Adjustment | .10 | .10 | .10 | .10 | .10 | .10 | .10 | .10 |
| Energy Conserving Equipment Investment Tax Credit | -.30 | -.07 | -.07 | -.07 | -.19 | -.09 | -.09 | -.09 |
| Capital Gains Tax Relief | -.10 | -.03 | -.03 | -.03 | -.03 | -.03 | -.03 | -.03 |
| Investment Tax Credit Eligible Tax Liability Extension | -.50 | -.13 | -.13 | -.13 | -.42 | -.20 | -.20 | -.20 |
| Other 1979 Tax Bill Changes | -.40 | -.10 | -.10 | -.10 | -.10 | -.10 | -.10 | -.10 |
| Decrease Due to Provisions of Tax Reduction and Simplification Act (1977) | -.30 | -.07 | -.07 | -.07 | -.19 | -.10 | -.10 | -.10 |
| Total | -1.50 | -.30 | -.03 | -.30 | -.82 | -.42 | -.42 | -.42 |

SOURCE: Wharton EFA, Inc., March 1, 1979.

# II. The Kentucky Economic Situation

by Charles Renfro and Paul Coomes

This chapter provides an assessment of Kentucky's economic situation at the beginning of 1979 and compares the performance of the Kentucky economy to that of the national economy. The first section of the chapter reviews the economic developments in the state during the period from 1973 through 1978. The second section presents the economic outlook for Kentucky for 1979 and 1980.

## The Kentucky Economy 1973-78

Almost four years have passed since the trough of the severe 1974-75 recession and the recovery has been unusual, both in nature and length. It is now evident that the Kentucky economy last reached a cyclical peak sometime during the summer or early fall of 1974. Manufacturing employment reached 296.5 thousand in June of that year, a level not to be reached again for four years. The unemployment rate in May of that year was 3.7 percent. However, because of strong growth in nonmanufacturing industries, total employment did not reach its peak until September 1974. Both nationally and in Kentucky, the cyclical upswing which ended in 1974 lasted three years and, in its last phase, was characterized by increasing employment, expanding real income and unsustainable rates of growth in aggregate output.

In comparison to the previous postwar national recessions, the 1974-75 recession was severe, and several circumstances contributed to this severity. Paradoxically, these help to explain the relatively better performance of the Kentucky economy both during and since the recession. The national economy began to show signs of exhaustion in late 1973 as capacity ceilings were hit in agriculture and other raw materials industries as a result of strong world demand. Almost across the board, prices began to increase sharply. Consumers took on an unprecedented amount of installment debt and housing starts weakened after reaching the 2.5 million units rate. However, if the oil embargo of 1973-74 and the subsequent quadrupling in the price of oil had not occurred, it is possible that the economic conditions in late 1973 might have resolved themselves into a more moderate cyclical slowdown. As it was, the oil embargo, the resulting widespread awareness of an energy crisis, the high and increasing rate of inflation in early 1974, and the general confusion of the period all played a catalytic role in the substantial inventory increases of late 1973 and early 1974 and other such excesses, which were followed by the layoffs and recession of 1974-75.

Kentucky experienced the national recession, but the recession's effects were principally felt in the manufacturing industries. In general, for Kentucky, the recession came later, was of shorter duration, and of less consequence. The recovery was quicker, and the expansion more pronounced. The strong demand for agricultural goods and for coal during the 1973 to 1975 period largely explains the performance of the Kentucky economy during the recession and early stages of the recovery. In particular, demand conditions for coal were important, both in terms of the direct stimulative effects on the Kentucky coal mining industry and in terms of the general expectations which developed; some of the economic expansion in the coal rich areas of Kentucky, especially eastern Kentucky, was a consequence of expectations that a new age of coal had begun.

The ability of the Kentucky economy to create new jobs is evidence of this economy's relatively better performance compared to the national economy. Since the spring of 1975, the Kentucky economy has been producing new jobs at a rate of approximately four to five thousand per month. This translates into a 4.2 percent average annual rate of growth and compares favorably with the national rate of 3.6 percent over the 1975 to 1978 period.

### Manufacturing

Manufacturing employment may be regaining only now the levels previously reached in 1974, but manufacturing is indisputably the largest single employment and income generating sector of the Kentucky economy, a role it has played since the 1960s. Both in Kentucky and nationally, manufacturing accounts for just over 20 percent of nonagricultural wage and salary employment. As a consequence, there are similarities in the cyclical behavior of the Kentucky and national industries during the 1975 to 1978 period, although there are also certain behavioral differences, due to differences in the composition of the U.S. and Kentucky manufacturing industries.

*The last full cycle.* By the third quarter of 1974, nearly all of Kentucky's manufacturing industries had reached their cyclical employment peaks. Furthermore, this quarter marked the end of a secular structural shift within manufacturing employment towards the higher paying, although more cyclical, durable manufacturing industries. Nearly 60 percent of manufacturing jobs were in durables, compared to only 50 percent twelve years earlier. However, two quarters later, at the trough of the recession, that share had fallen to 56 percent. It has risen only one percentage point since.

*The 1974-75 recession.* During the recession, Kentucky manufacturing employment behaved similarly to that of the U.S., except that the state-level industries felt the impact later and more severely. The pattern of manufacturing employment behavior for Kentucky is shown in Figure 1. However, this pattern of behavior is less representative of those Kentucky industries which had the highest levels of employment. For example, in electrical and nonelectrical equipment manufacturing, the largest two digit SIC employers, the dates of employment peaks in the state were identical to those of the nation. Nonetheless, nearly all of the state's durable manufacturers were forced to make greater percentage cuts in their work force than occurred at the national level.

Not surprisingly, the list of state industries hit hardest by the recession is almost identical to such a list for the United States as a whole. All of the durable goods industries, except nonelectrical machinery, and the textiles, apparel, and rubber and plastic products industries, among nondurables, experienced greater percentage employment declines than did the manufacturing industry as a whole–both for Kentucky and the U.S.[1]

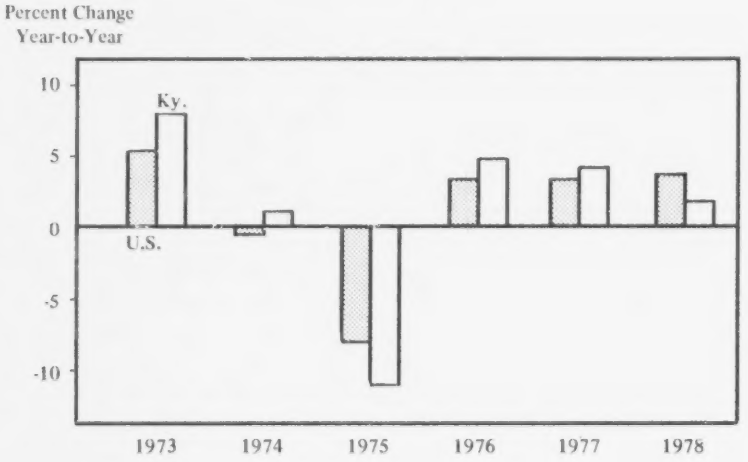
Of course, percentage declines in employment do not fully measure the impact of a recession. The duration of a period of slack is equally important. However, these findings are not significantly changed if the lengths of the respective peak to trough periods are considered, as illustrated in Table 1. Textiles and apparel both experienced lengthy recessions nationally, and, in Kentucky, so did durables.

*The recovery.* There was a marked difference in the comparative industry distribution of recovery. In general, Kentucky nondurable industries regained their pre-recession peaks more quickly than did the corresponding U.S. industries, but the Kentucky durable goods industries were slower to recover than their U.S. counterparts. This is not surprising in light of the fact that Kentucky's nondurable industries were hit less hard by the recession than the U.S. industries. However, it does suggest the possible instability of the strong growth in durables witnessed in Kentucky prior to and during 1974.

In a recovery noted for its ability to produce a record number of new jobs throughout the economy, it might be expected that not only would most manufacturing industries regain their pre-recession employment peaks, but that employment would expand. However, as indicated by Table 1, many of Kentucky's manufacturing industries had not recovered their 1974 employment levels even by the end of 1978.

Nevertheless, several industries have grown rapidly since the 1975 trough, and will be primarily responsible for any net expansion that manufacturing may realize

FIGURE 1. ANNUAL PERCENTAGE CHANGE IN MANUFACTURING EMPLOYMENT, 1973-78*




*1978 data are preliminary.

TABLE 1

CYCLICAL BEHAVIOR OF MANUFACTURING EMPLOYMENT, UNITED STATES AND KENTUCKY, 1973-78
(All Employment Data in Thousands and Seasonally Adjusted)[1]

| | | 1973-75 Recession | | | | | | | | | | 1975-78 Recovery | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak | | | | Trough | | | | Percent Change | | Current Level | | Percent Change | |
| | | Date | | Level | | Date | | Level | | Peak to Trough | | Dec. 1978 | Dec. 1978 | Trough to Present | |
| SIC | Industry | U.S. | Ky. | U.S. | Ky. | U.S. | Ky. | U.S. | Ky. | U.S. | Ky. | U.S. | Ky. | U.S. | Ky. |
| 20 | Food and Kindred Products | 3/74 | 12/73 | 1,734 | 22.8 | 2/75 | 3/75 | 1,643 | 21.2 | -5.3 | -7.0 | 1,710 | 22.6 | 4.1 | 6.6 |
| 21 | Tobacco Manufacturers | 12/73 | 10/74 | 79 | 14.2 | 4/75 | 6/75 | 72 | 12.4 | -8.9 | -12.7 | 72 | 15.7 | 0.0 | 26.6 |
| 22 | Textile Mill Products | 3/73 | 8/74 | 1,016 | 7.6 | 3/75 | 3/75 | 815 | 6.2 | -19.8 | -18.4 | 910 | 6.9 | 11.7 | 11.3 |
| 23 | Apparel and Other Textiles | 4/73 | 6/74 | 1,451 | 30.3 | 3/75 | 3/75 | 1,183 | 24.8 | -18.5 | -18.2 | 1,313 | 27.2 | 11.0 | 9.7 |
| 26 | Paper and Allied Products | 3/74 | 9/74 | 715 | 6.9 | 5/75 | 11/74 | 627 | 6.0 | -12.3 | -13.0 | 701 | 7.7 | 11.8 | 28.3 |
| 27 | Printing and Publishing | 12/73 | 5/74 | 1,117 | 12.0 | 7/75 | 9/74 | 1,074 | 11.6 | -3.8 | -3.3 | 1,205 | 13.6 | 12.2 | 17.2 |
| 28 | Chemical and Allied Products | 9/74 | 10/74 | 1,071 | 13.8 | 7/75 | 3/75 | 1,003 | 13.1 | -6.3 | -5.1 | 1,096 | 16.3 | 9.3 | 24.4 |
| 29 | Petroleum and Coal Products | 11/74 | 11/74 | 198 | 3.1 | 2/75 | 1/75 | 187 | 2.9 | -5.6 | -6.5 | 211 | 4.0 | 12.8 | 37.9 |
| 30 | Rubber and Plastic Products | 8/74 | 7/74 | 707 | 9.2 | 2/75 | 6/75 | 587 | 6.7 | -17.0 | -27.2 | 769 | 9.8 | 31.0 | 46.3 |
| 31 | Leather and Leather Products | * | 3/74 | * | 5.8 | 3/75 | 3/75 | 235 | 4.4 | * | -24.1 | 246 | 4.3 | 4.7 | -2.3 |
| | Total Nondurable Goods | 12/73 | 3/74 | 8,304 | 123.2 | 3/75 | 3/75 | 7,462 | 112.5 | -10.1 | -8.7 | 8,233 | 127.9 | 10.3 | 13.7 |
| 24 | Lumber and Wood Products | 3/74 | 1/74 | 752 | 12.5 | 3/75 | 3/75 | 590 | 8.2 | -21.5 | -34.4 | 763 | 9.0 | 29.3 | 9.8 |
| 25 | Furniture and Fixtures | 6/73 | 12/73 | 511 | 6.4 | 3/75 | 4/75 | 401 | 4.8 | -21.5 | -25.0 | 491 | 6.5 | 22.4 | 35.4 |
| 32 | Stone, Clay and Glass Products | 12/73 | 2/74 | 730 | 10.8 | 7/75 | 3/75 | 618 | 8.3 | -25.3 | -23.1 | 707 | 8.6 | 14.4 | 3.6 |
| 33 | Primary Metal Industries | 10/74 | 9/74 | 1,300 | 18.2 | 7/75 | 9/75 | 1,097 | 15.0 | -15.6 | -17.6 | 1,241 | 18.5 | 13.1 | 23.3 |
| 34 | Fabricated Metal Products | 11/73 | 2/74 | 1,669 | 22.2 | 7/75 | 4/75 | 1,416 | 17.3 | -15.2 | -22.1 | 1,699 | 21.9 | 20.0 | 26.6 |
| 35 | Machinery Except Electrical | 10/74 | 10/74 | 2,240 | 36.5 | 7/75 | 8/75 | 2,005 | 33.2 | -10.5 | -9.0 | 2,427 | 40.5 | 21.0 | 22.0 |
| 36 | Electrical Equipment | 12/73 | 12/73 | 2,028 | 48.2 | 7/75 | 4/75 | 1,668 | 32.7 | -17.8 | -32.2 | 2,008 | 38.5 | 20.4 | 17.7 |
| 37 | Transportation Equipment | 10/73 | 9/74 | 1,946 | 14.1 | 2/75 | 5/75 | 1,683 | 12.3 | -13.5 | -12.8 | 2,023 | 16.9 | 20.2 | 37.4 |
| 38-39 | Miscellaneous Durables | 6/74 | 3/74 | 1,057 | 8.4 | 6/75 | 7/75 | 941 | 6.0 | -11.0 | -28.6 | 1,131 | 7.2 | 20.2 | 20.0 |
| | Total Durable Goods | 12/73 | 3/74 | 12,128 | 174.1 | 7/75 | 6/75 | 10,494 | 139.4 | -13.5 | -19.9 | 12,490 | 168.7 | 19.0 | 21.0 |
| Total Manufacturing | | 12/73 | 3/74 | 20,432 | 298.0 | 7/75 | 6/75 | 18,074 | 253.3 | -11.5 | -15.0 | 20,723 | 296.8 | 14.7 | 17.2 |

[1] Seasonal Adjustment of U.S. data by U.S. Bureau of Labor Statistics' Seasonal Factor Method; Kentucky data adjusted using U.S. Bureau of the Census X-11 method by KCEA staff.

*The Leather Manufacturing Industry is undergoing a secular decline nationally and the data for that industry show no prerecession peak.

SOURCE: U.S. data, *Employment and Earnings*, October 1978 and January 1979 issues; unadjusted Kentucky data, Kentucky Department for Human Resources.

in this cycle. Chemical and allied products created the most nondurable goods jobs in Kentucky as did printing and publishing in the United States as a whole. Among the durables, nonelectrical machinery has been the major growth industry in both the U.S. and Kentucky. In Kentucky there has also been significant growth in transportation equipment employment, at least until very recently.

## Mining

During the early period of recovery, from the spring of 1975 through even as late as 1977, Kentucky's manufacturing industries recovered relatively rapidly. However, in the past year to a year and a half, they grew more slowly than their U.S. counterparts. The behavior of the mineral industry has been similar. After a period of boom which lasted from 1974 through 1975 and into 1976, the performance of the mineral industry faltered in 1977 and 1978; even earlier, there were some signs of weakness.

Minerals extracted in Kentucky include natural gas and crude petroleum, stone, sand and gravel, clays and certain other items, but, fundamentally, Kentucky is a coal mining area. Coal revenues account for over 90 percent of the total value of Kentucky mineral production. In particular, in 1975, the latest year for which the necessary data are presently available, 93.2 percent of this value was attributed to coal. Similarly, in that year, coal mining employment accounted for over 89 percent of the mining employment in the state. Hence, while conditions in the coal industry do not fully explain Kentucky mineral production and employment, not much error is created by ignoring other sectors of the industry in considering year-to-year changes.

Coal production figures for the 1973-78 period are shown in Table 2 for eastern and western Kentucky, as well as for the state as a whole. The coal strike which occurred in late 1977 and in the first quarter of 1978 caused at least some of the decline in coal production in 1978, but it is evident from the table that there was a substantial increase in production from 1970 to 1975, after which it began to show signs of peaking and then decline. The latest indications are that mine inventories have begun to increase noticeably, implying that even in the absence of the strike-induced lower level of production in 1978, there would have been some decline in coal production during the 1977-78 period.

TABLE 2

KENTUCKY COAL PRODUCTION, 1970-78
(Millions of Short Tons)

| Year | Eastern Kentucky | Western Kentucky | Kentucky Total |
|---|---|---|---|
| 1970 | 72.502 | 52.803 | 125.305 |
| 1971 | 71.690 | 47.819 | 119.390 |
| 1972 | 68.858 | 52.330 | 121.187 |
| 1973 | 73.966 | 53.679 | 127.645 |
| 1974 | 85.356 | 51.841 | 137.197 |
| 1975 | 87.257 | 56.356 | 143.613 |
| 1976 | 91.138 | 52.834 | 143.972 |
| 1977 | 93.957 | 52.306 | 146.262 |
| 1978 | 92.565 | 38.650 | 131.215 |

SOURCE: U.S. Department of Energy, *Energy Data Report*, Office of Energy Data and Interpretation; Kentucky Economic Information System.

In contrast, as shown in Table 3, coal mining employment was on a rising trend through 1977 and 1978. The increase in employment during the 1973-76 period largely reflects the increasing level of coal production.

TABLE 3

KENTUCKY COAL MINING EMPLOYMENT, 1970-78
(Thousands)

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|---|---|---|
| Eastern Kentucky | 20.452 | 21.671 | 20.206 | 20.499 | 27.824 | 25.450 | 29.481 | NA | NA |
| Western Kentucky | 5.239 | 6.581 | 7.410 | 7.476 | 9.221 | 10.620 | 10.012 | NA | NA |
| Kentucky Total[1] | 25.691 | 28.252 | 27.616 | 27.975 | 37.045 | 36.070 | 39.493 | NA | NA |
| Kentucky Total[2] | 22.733 | 24.717 | 26.392 | 26.683 | 34.433 | 41.475 | 41.817 | 45.508 | 47.883 |

NA = Not available at publication time.

SOURCE: [1]U.S. Department of Energy, *Energy Data Report*, Office of Energy Data and Interpretation; Kentucky Economic Information System.
[2]Kentucky Department for Human Resources, BLS 790 Monthly Survey of Establishments; Kentucky Economic Information System.

During the subsequent two years, the generally increasing employment may reflect the effects of the 1969 Coal Mine Health and Safety Act, at least as much as it reflects the demand conditions for coal. Increases in coal prices, shown in Table 4, also partly reflect the impact of regulation, but the major impetus was the energy crisis of 1973-74, which dramatically increased the demand for coal.

TABLE 4

COAL PRICES
AVERAGE VALUE PER TON
EASTERN KENTUCKY, WESTERN KENTUCKY,
AND KENTUCKY AVERAGE
1970-77

| Year | Eastern Kentucky | Western Kentucky | Kentucky Average |
|---|---|---|---|
| 1970 | $ 6.730 | $ 4.220 | $ 5.673 |
| 1971 | 7.600 | 4.826 | 6.489 |
| 1972 | 8.010 | 5.225 | 6.805 |
| 1973 | 9.030 | 5.930 | 7.730 |
| 1974 | 22.010 | 8.920 | 17.063 |
| 1975 | 20.790 | 12.160 | 17.400 |
| 1976 | 23.030 | 14.180 | 19.790 |
| 1977 | 25.980 | 19.880 | 23.767 |

SOURCE: U.S. Department of Energy, *Energy Data Report*, Office of Energy Data and Interpretation; Kentucky Economic Information System.

It is ironic that during the 1975-77 period, which was a period of relatively weak demand for steel, coal production should have been maintained. Since 1977, as coal production has decreased, steel production has increased. The explanation, of course, is that the decline in coal demand has principally taken the form of a decline in demand for high sulphur steam coal, not low sulphur metallurgical coal. Note, from Table 2, that in 1978, it was in western Kentucky that the greatest percentage decline in production occurred.

## Agriculture

Agriculture is an industry which has experienced a secular decline in employment during the postwar period. During the period 1973-78, this secular decline was generally evident, except that during the years 1974 through 1976 there was a rise in employment which appears to have been temporary. The increase may reflect the slow growth in manufacturing in this period, as a number of part-time farmers returned to full-time farming, and possibly the generally good economic conditions for farming then.

In terms of net farm income, the period is divided into two halves, with 1975 being the weak separating year. The net farm income for 1975 of $473 million was below both the $562 million of 1973 and the record $649 million of 1974. Since 1975, net farm income has risen, reaching $537 million in 1976 and $547 million in 1977, the latest year for which a figure has been reported.

As suggested earlier, agriculture experienced a boom during the 1973 to 1974 period, which then tapered off as the prices of both livestock and grain fell during the 1975-76 period. During 1977-78, particularly in 1978,

TABLE 5

KENTUCKY AGRICULTURAL STATISTICS

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|---|---|---|
| Total Agricultural Employment (Units) | 94,183 | 84,217 | 78,442 | 71,333 | 85,942 | 85,375 | 91,542 | 87,358 | 73,058 |
| Hired Farm Workers | 28,083 | 27,750 | 27,583 | 29,583 | 32,500 | 21,000 | 30,000 | 29,000 | 33,000 |
| Non-Hired Farm Workers | 66,100 | 56,467 | 50,859 | 41,750 | 53,442 | 64,375 | 61,542 | 58,358 | 40,058 |
| Total Cash Receipts (Millions $) | 926.8 | 945.6 | 1085.4 | 1319.4 | 1482.9 | 1441.0 | 1645.7 | 1805.8 | 1970.6* |
| Livestock & Products | 517.3 | 536.9 | 593.3 | 742.5 | 583.2 | 676.1 | 728.4 | 741.2 | 937.2* |
| Crops | 409.5 | 408.7 | 492.1 | 576.9 | 899.7 | 764.8 | 917.4 | 1064.6 | 1033.3* |
| Total Net Farm Income (Millions $) | 361.1 | 370.2 | 480.2 | 562.1 | 648.8 | 473.3 | 536.8 | 546.8 | NA |

*Preliminary figures.
NA = Not available.

SOURCE: *Kentucky Farm Labor* and *Kentucky Agricultural Prices*, Kentucky Crop and Livestock Reporting Service, U.S. Department of Agriculture; Kentucky Economic Information System.

agricultural prices again increased. Table 5 summarizes agricultural data.

## The Kentucky Economic Outlook 1979-80

At the beginning of 1979, the Kentucky economy is vunerable in a way in which it was not at the time of the 1974-75 recession. Then, the impact of the national recession on the Kentucky economy was blunted by considerable strength in both agriculture and coal mining. Now, however, there is sufficient weakness in the demand for coal that if a national recession occurs in the near future, the Kentucky economy is likely to be as much affected as the U.S. economy.

Economic forecasts in general depend upon various assumptions, including the assumption of the absence of war and other such major disasters. However, a particular characteristic of the forecasts of the Kentucky economy, or any other state economy, is that they depend upon the assumptions which are made about the U.S. economy. In turn, the performance of the U.S. economy will depend to some degree upon the economic policies that have been and will be adopted by the federal government.

It appears likely that during the 1979-80 period, the federal government will adopt both a restrictive monetary policy, leading to the maintenanc of the present relatively high rates of interest, and a restrictive fiscal policy. The fiscal policy measures which will be adopted are likely to be framed so as to result in a reduction in the rate of growth of federal government expenditures, if not an outright decrease in the amount, in an attempt to reduce or even eliminate the federal government budgetary deficit.

At the moment, it is not obvious exactly which federal government programs are likely to be reduced. However, one of the effects of the more restrictive federal government fiscal policy stance is likely to be a reduction in grants-in-aid to states. A federal government expenditure reduction of this type will have an effect on the Kentucky economy through a reduction in government expenditures in Kentucky and through its general effect on the U.S. economy.

However, it is not only federal government policies which have an effect on the Kentucky economy. State and local governments, through their tax and expenditure policies, also affect the state economy. In some cases, the policies adopted could be intended to affect the economy. In other cases, the policies adopted may have an impact on the economy which is unintentional. Furthermore, some state and local government expenditures may be the result of federal government policies, as, for example, in the case of the CETA program. In such cases, changes in state and local government expenditures might be regarded as being the result of federal government policy initiatives, except that state and local governments do always have the option of offsetting them through changes in state and local government taxes.

This year, as in past years, a quantitative assessment of the economic outlook for Kentucky is provided by forecasts made using the Kentucky Quarterly Econometric Model. One of these, technically known as the "Control Forecast," presents a view of the future which is thought to be most likely to be realized.[2] The others, known as "Alternative Forecasts," provide an indication of the effect of changes in the particular assumptions on which the Control Forecast is based.

There are two alternatives provided. One of these is based upon the assumption that the federal government reduction in grants-in-aid to states will be greater than that embodied in the Control Forecast. The other alternative provides some indication of the effect on the Kentucky economy of a particular legislative change made during the 1979 Special Session of the Kentucky General Assembly.

## Kentucky Quarterly Model Control Forecast 1979-80

The Control Forecast is presented in detail in Appendix Tables A-1 through A-4. This Kentucky forecast corresponds to the Wharton Model forecast for the United States discussed in the previous chapter and subsequently shown in an appendix table to that chapter.

The Kentucky Control Forecast has two characteristics which should be noted immediately. The first is that for 1978, 1979 and 1980, each of the numbers in the tables are *forecasted* numbers. This is true of even the annual figures for 1978. The model estimates appear to be descriptive of the behavior of the Kentucky economy in 1978; however, because of the present lack of data on the Kentucky economy during the second half of 1978 particularly, it has been necessary to begin the model forecast period with the first quarter of that year. Although the only quarterly numbers shown are those for 1979 and 1980, the model forecasts were actually made for the whole of the period from the first quarter of 1978 through the fourth quarter of 1980.

The second characteristic of the tables is that the figures shown for the labor force, total employment, and the unemployment rate are not exactly comparable in concept to those published by the Kentucky Department for Human Resources. The Department for Human Resources is required to construct their estimates in accordance with a methodology laid down by the U.S. Bureau of Labor Statistics. This

methodology involves the use of the Current Population Survey, U.S. Bureau of the Census, to arrive at estimates of these quantities which are independent of the industry employment results.[3] In contrast, the forecasts are made by summing the forecasted industry employment figures and then adjusting for net out-of-state commuting by Kentucky residents.

The Kentucky Control Forecast indicates that, after quite strong employment growth in 1978, it is likely that the growth will be much more moderate during the 1979-80 period, in keeping with the Wharton prediction for the national economy. As shown in summary form in Table 6, after growing at a rate of about 5.5 percent in 1978, to a level of approximately 1.2 million for the year, nonagricultural wage and salary employment is expected to taper off in its rate of growth, to less than 3 percent in 1979 and just over 2 percent in 1980. In each of these two years, manufacturing employment is expected to grow by about 10 thousand jobs. The growth in manufacturing employment is expected to be principally in the durable goods industries, reflecting the expected national strength in business fixed investment expenditures, as much as anything else. Nonmanufacturing employment is expected to increase by about 20 thousand jobs in 1979 and 15 thousand in 1980.

During this time, as also shown in Table 6, Kentucky Personal Income is expected to grow at a fairly robust pace. In 1978, Kentucky Personal Income should be about $23 billion. It is expected to grow by about 13.5 percent in 1979 to approximately $26 billion. In 1980, it is expected to grow at a rate of more than 11.5 percent, to just over $29 billion. Generally, the increase in income reflects an increase in wages and employment, but some of the growth during the 1979-80 period is expected to be a result of higher farm prices, which should increase faster than operating costs, thus leading to an increase in farm proprietors' net income. However, some of the proprietors' net income growth represents an expected increase in the value of farm inventories—cattle in particular. Consequently, in terms of *realized* farm proprietors' net income, 1979 specifically may not be as good a year as it might appear from the appendix forecast tables.

Even more generally, the income growth during the 1979-80 period is to some degree illusionary. As illustrated in Table 7, once account is taken of inflation, by expressing Kentucky Personal Income in 1972 dollars, the income growth is somewhat less. It is also instructive to compare, as does this table, per capita income growth in current dollars to per capita income growth in 1972 dollars.

## Alternative Forecast: Utility Bills Not Exempted

As suggested earlier, one of the purposes of making alternative forecasts can be to illustrate the effects of changes in the various assumptions which underlie the

TABLE 6

KENTUCKY QUARTERLY ECONOMETRIC MODEL CONTROL FORECAST
ANNUAL SUMMARY TABLE
SELECTED ECONOMIC INDICATORS

| Description | 1978 | 1979 | 1980 |
|---|---|---|---|
| Personal Income (Millions) | 23097.7 | 26223.8 | 29252.1 |
| % Chg.: Ky. Personal Income | 12.34 | 13.53 | 11.55 |
| Wage & Salary Disbursement | 13992.2 | 15997.0 | 17970.2 |
| Mfg. Wage & Salaries | 4082.7 | 4811.2 | 5561.6 |
| Non-Mfg. Wage & Salaries | 9909.5 | 11185.8 | 12408.6 |
| Total Employment (Thousands) | 1472.7 | 1519.5 | 1546.2 |
| Non-Agri. Wage & Salary Empl. | 1217.9 | 1251.0 | 1276.2 |
| % Chg.: Ky. Non-Ag. Empl. | 5.54 | 2.72 | 2.01 |
| Manufacturing Employment | 289.8 | 300.6 | 311.7 |
| Durable Goods | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 124.4 | 125.8 | 128.0 |
| Non-Mfg., Non-Agri. Empl. | 928.1 | 950.4 | 964.5 |
| Civilian Labor Force (Thousands) | 1571.7 | 1629.4 | 1662.6 |
| Ky. Unemployment Rate (%) | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

TABLE 7

KENTUCKY QUARTERLY ECONOMETRIC MODEL CONTROL FORECAST
KENTUCKY PERSONAL INCOME

| Description | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|
| Kentucky Personal Income (Millions) | 20,561.0 | 23,097.7 | 26,223.8 | 29,252.1 |
| Percent Change | 10.54 | 12.34 | 13.53 | 11.55 |
| Kentucky Per Capita Personal Income | 5,945.0 | 6,591.8 | 7,370.4 | 8,118.8 |
| Percent Change | 9.81 | 10.88 | 11.81 | 10.15 |
| Kentucky Real Personal Income (Millions) | 14,613.4 | 15,367.7 | 16,177.5 | 16,821.2 |
| Percent Change | 4.57 | 5.16 | 5.27 | 3.99 |
| Kentucky Real Per Capita Personal Income | 4,225.3 | 4,385.8 | 4,546.8 | 4,668.7 |
| Percent Change | 3.87 | 3.80 | 3.67 | 2.68 |

Forecast Date: March 5, 1979.

Control Forecast. This alternative forecast does just that. One of the principle acts of the 1979 Special Session of the General Assembly was to pass a measure exempting residential utility bills from the state sales and use tax. This measure takes effect in the third quarter of 1979, so that one of the "assumptions" of the Control Forecast is the elimination of this tax.

In order to assess the particular effect of the elimination of this tax, an alternative forecast has been made which, in its assumptions, differs from the Kentucky Control Forecast in only one respect: it assumes that residential utility bills have *not* been exempted. Otherwise, this alternative forecast is made on exactly the same basis as the Control Forecast.

For selected economic indicators, the quarterly detail of this alternative forecast is shown in Appendix Table A-5. An annual summary for the period from 1978 through 1980 is shown as Table 8; this table can be

TABLE 8

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST
ANNUAL SUMMARY TABLE
UTILITY BILLS NOT EXEMPTED FROM SALES AND USE TAX
SELECTED ECONOMIC INDICATORS

| Description | 1978 | 1979 | 1980 |
|---|---|---|---|
| Personal Income (Millions) | 23097.7 | 26197.3 | 29196.4 |
| % Chg.: Ky. Personal Income | 12.34 | 13.42 | 11.45 |
| Wage & Salary Disbursement | 13992.2 | 15995.3 | 17964.5 |
| Mfg. Wage & Salaries | 4082.7 | 4811.2 | 5561.2 |
| Non-Mfg. Wage & Salaries | 9909.5 | 11184.1 | 12403.4 |
| Total Employment (Thousands) | 1472.7 | 1519.4 | 1545.9 |
| Non-Agri. Wage & Salary Empl. | 1217.9 | 1250.9 | 1275.8 |
| % Chg.: Ky. Non-Ag. Empl. | 5.54 | 2.71 | 1.99 |
| Manufacturing Employment | 289.8 | 300.6 | 311.7 |
| Durable Goods | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 124.4 | 125.8 | 128.0 |
| Non-Mfg., Non-Agri. Empl. | 928.1 | 950.3 | 964.1 |
| Civilian Labor Force (Thousands) | 1571.7 | 1629.3 | 1662.3 |
| Kentucky Unemployment Rate (%) | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

TABLE 9

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF ELIMINATION OF UTILITY TAX
(Differences)

| Description | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | 52.523 | 53.797 | 54.613 | 55.262 | 55.754 | 55.973 |
| Kentucky Real Personal Income (Millions) | 32.113 | 32.313 | 32.242 | 32.020 | 31.832 | 31.383 |
| Disposable Personal Income (Millions) | 47.355 | 48.199 | 48.840 | 49.105 | 49.477 | 49.621 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | 5.167 | 5.598 | 5.773 | 6.159 | 6.277 | 6.352 |
| State Tax and Non-Tax Payments (Millions) | 1.342 | 1.442 | 2.207 | 2.965 | 3.690 | 4.390 |
| Federal Tax and Non-Tax Payments (Millions) | 2.979 | 3.262 | 2.635 | 2.234 | 1.598 | 0.951 |
| Total Employment (Thousands) | 0.124 | 0.231 | 0.294 | 0.325 | 0.336 | 0.342 |
| Non-Agricultural Wage and Salary Employment (Thousands) | 0.141 | 0.263 | 0.339 | 0.380 | 0.396 | 0.403 |
| Civilian Labor Force, NRA (Thousands) | 0.124 | 0.223 | 0.277 | 0.302 | 0.310 | 0.318 |
| Kentucky Unemployment Rate (Percent) | -0.000 | -0.001 | -0.002 | -0.003 | -0.003 | -0.003 |

Forecast Date: March 5, 1979.

compared to Table 6, shown earlier, in order to determine the effect of eliminating the tax.

On a quarterly basis, the net effect is shown in Tables 9 and 10. Table 9 illustrates the differences between the forecasted values for each of the relevant quarters. Table 10 also shows the effect of eliminating the tax, but in percentage terms. For example, Table 9 indicates that the effect in the third quarter of 1979 (1979.3) is a $52.5 million increase in Kentucky Personal Income, which is shown in Table 10 to represent a 0.2 percent increase in Personal Income.

Looking at Table 9, it should be noted that there is a slight cumulative effect from quarter to quarter, despite the fact that the tax base might be expected to remain more or less constant over the forecast horizon. This cumulative effect illustrates the dynamic nature of changes in economic conditions.

## Alternative Forecast: Federal Budget Effects

Changes in federal government Grants-in-Aid to the states can have a particular effect on a state economy in addition to their overall effect on the United States economy; that is, on all states together. It was mentioned in the previous chapter that the Wharton

TABLE 10

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF ELIMINATION OF UTILITY TAX
(Percent Changes)

| Description | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|---|
| Kentucky Personal Income | 0.199 | 0.198 | 0.195 | 0.193 | 0.188 | 0.184 |
| Kentucky Real Personal Income | 0.199 | 0.198 | 0.195 | 0.193 | 0.188 | 0.184 |
| Disposable Personal Income | 0.205 | 0.204 | 0.201 | 0.198 | 0.193 | 0.189 |
| Total Tax and Non-Tax Payments, Kentucky | 0.153 | 0.159 | 0.155 | 0.158 | 0.157 | 0.153 |
| State Tax and Non-Tax Payments | 0.171 | 0.175 | 0.252 | 0.325 | 0.389 | 0.446 |
| Federal Tax and Non-Tax Payments | 0.141 | 0.149 | 0.113 | 0.092 | 0.064 | 0.037 |
| Total Employment | 0.008 | 0.015 | 0.019 | 0.021 | 0.021 | 0.022 |
| Non-Agricultural Wage and Salary Employment | 0.011 | 0.021 | 0.027 | 0.030 | 0.031 | 0.031 |
| Civilian Labor Force, NRA | 0.008 | 0.014 | 0.017 | 0.018 | 0.019 | 0.019 |
| Kentucky Unemployment Rate | -0.008 | -0.021 | -0.034 | -0.042 | -0.044 | -0.042 |

Forecast Date: March 5, 1979.

Control forecast for the United States is based upon the assumption that Congress will make changes in the Administration's budget proposals before it enacts the federal government budget for the coming federal fiscal year.[4] It is, for example, likely that the Congress will not cut back on Grants-in-Aid to the states in the precise way proposed by the Administration. In fact, the specific Wharton assumption is that Grants-in-Aid will be higher, as enacted, than as in President Carter's proposals.

In order to attempt to assess the effect of changes in the level of federal government Grants-in-Aid on the Kentucky economy, an alternative forecast has been made with *both* the Wharton Model and the Kentucky Quarterly Model. A new forecast has been made with the Wharton Model which differs from the Wharton Control Forecast *only* in the assumption about federal government Grants-in-Aid. This alternative forecast assumes the Administration's Grants-in-Aid proposal. The Kentucky forecast, in turn, embodies all the assumptions about *state* economic conditions in the state Control Forecast shown in Appendix Tables A-1 through A-4.

The effect on the Kentucky economy of adopting the Administration's Grants-in-Aid proposal is shown in Table 11, which can be compared to the Kentucky Control Forecast, as illustrated in Table 6. On a quarterly basis, the net effect is presented in Tables 12 and 13. Table 12 shows the differences which occur as a result of the hypothetical adoption of the President's Grants-in-Aid proposal. Table 13 shows the percent changes which are implied. Thus, for example, the effect in the fourth quarter of 1979 is shown in Table 12 to be an $18.3 million decrease in Kentucky Personal Income. Table 13 shows this to represent a 0.07 percent change in Personal Income. It should also be noted that the change in the assumption about the level of Grants-in-Aid has a cumulative effect on the Kentucky economy. The effect is stronger after five quarters, in 1980.4, than in 1979.4. As before, this illustrates the dynamic characteristics of changes in economic conditions.

Footnotes

[1] Three minor exceptions to this statement are the Kentucky leather products and the U.S. paper products and miscellaneous durable industries.

[2] At the national level, this is the proper interpretation of the "Control Forecast." However, at the state level, it may be more correct to say that the state control forecast is that one which is based upon the national control forecast, which is not necessarily the same as saying that the control forecast is the one most likely to be realized.

[3] Brian Motley, "The Unemployment Rate as an Economic Indicator at the State and Local Levels," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 3 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Mukhtar M. Ali, "CPS Estimate of the Unemployment Rate of the State of Kentucky," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 4 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Brian Motley, "Unemployment and Labor Force Participation," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 5 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Brian Motley, "Estimating Unemployment Rates by County in Kentucky," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 6 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977).

[4] See page 12 and Appendix Table A-2 to Chapter I.

TABLE 11

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST
ANNUAL SUMMARY TABLE
ADMINISTRATION'S GRANTS-IN-AID PROPOSAL
SELECTED ECONOMIC INDICATORS

| Description | 1978 | 1979 | 1980 |
|---|---|---|---|
| Personal Income (Millions) | 23097.7 | 26213.0 | 29219.3 |
| % Chg: Ky. Personal Income | 12.34 | 13.49 | 11.47 |
| Wage and Salary Disbursement | 13992.2 | 15985.5 | 17936.9 |
| Mfg. Wage & Salaries | 4082.7 | 4811.3 | 5561.6 |
| Non-Mfg. Wage and Salaries | 9909.5 | 11174.2 | 12375.3 |
| Total Employment (Thousands) | 1472.7 | 1518.3 | 1542.9 |
| Non-Agri. Wage & Salary Empl. | 1217.9 | 1249.7 | 1272.8 |
| % Chg.: Ky. Non-Ag. Empl. | 5.54 | 2.61 | 1.85 |
| Manufacturing Employment | 289.8 | 300.6 | 311.7 |
| Durable Goods | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 124.4 | 125.8 | 128.0 |
| Non-Mfg., Non-Agri. Empl. | 928.1 | 949.1 | 961.1 |
| Civilian Labor Force (Thousands) | 1571.7 | 1628.2 | 1659.4 |
| Ky. Unemployment Rate (%) | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

TABLE 12

KENTUCKY QUARTERLY ECONOMETRIC MODEL
EFFECT OF ADMINISTRATION'S PROPOSAL FOR GRANTS-IN-AID
(Differences)

| Description | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | -18.340 | -23.617 | -29.246 | -35.629 | -42.574 |
| Kentucky Real Personal Income (Millions) | -11.023 | -13.953 | -16.977 | -20.398 | -24.227 |
| Disposable Personal Income (Millions) | -12.973 | -17.074 | -21.598 | -26.645 | -32.184 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | -5.369 | -6.543 | -7.648 | -8.984 | -10.391 |
| State Tax and Non-Tax Payments (Millions) | -1.053 | -1.336 | -1.617 | -1.951 | -2.315 |
| Federal Tax and Non-Tax Payments (Millions) | -3.747 | -4.471 | -5.122 | -5.923 | -6.749 |
| Manufacturing Gross Products Originating (Millions) | -0.035 | -0.113 | -0.289 | -0.527 | -0.840 |
| Gross Product Originating, Durable Goods (Millions) | -0.020 | -0.055 | -0.133 | -0.254 | -0.422 |
| Gross Product Originating, Non-Durables (Millions) | -0.015 | -0.061 | -0.156 | -0.276 | -0.416 |
| Real Value of Mineral Production (Millions) | -0.002 | -0.007 | -0.018 | -0.028 | -0.050 |
| Total Employment (Thousands) | -2.027 | -2.549 | -3.075 | -3.607 | -4.147 |
| Non-Agricultural Wage and Salary Employment (Thousands) | -2.035 | -2.562 | -3.090 | -3.625 | -4.164 |
| Civilian Labor Force, NRS (Thousands) | -1.922 | -2.413 | -2.913 | -3.426 | -3.950 |
| Kentucky Unemployment Rate (Percent) | 0.013 | 0.017 | 0.020 | 0.023 | 0.026 |

Forecast Date: March 5, 1979.

TABLE 13

KENTUCKY QUARTERLY ECONOMETRIC MODEL
EFFECT OF ADMINISTRATION'S PROPOSAL FOR GRANTS-IN-AID
(Percent Changes)

| Description | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 |
|---|---|---|---|---|---|
| Kentucky Personal Income | -0.068 | -0.084 | -0.102 | -0.120 | -0.140 |
| Kentucky Real Personal Income | -0.068 | -0.084 | -0.102 | -0.121 | -0.142 |
| Disposable Personal Income | -0.055 | -0.070 | -0.087 | -0.104 | -0.122 |
| Total Tax and Non-Tax Payments, Kentucky | -0.153 | -0.176 | -0.197 | -0.224 | -0.249 |
| State Tax and Non-Tax Payments | -0.128 | -0.153 | -0.177 | -0.206 | -0.235 |
| Federal Tax and Non-Tax Payments | -0.171 | -0.192 | -0.210 | -0.236 | -0.260 |
| Manufacturing Gross Product Originating | -0.001 | -0.002 | -0.004 | -0.008 | -0.012 |
| Gross National Originating, Durable Goods | -0.000 | -0.001 | -0.003 | -0.006 | -0.010 |
| Gross Product Originating, Non-Durables | -0.001 | -0.002 | -0.006 | -0.011 | -0.016 |
| Real Value of Mineral Production | -0.000 | -0.001 | -0.001 | -0.002 | -0.004 |
| Total Employment | -0.133 | -0.167 | -0.200 | -0.233 | -0.266 |
| Non-Agricultural and Salary Employment | -0.162 | -0.203 | -0.244 | -0.284 | -0.324 |
| Civilian Labor Force, NRA | -0.119 | -0.148 | -0.178 | -0.208 | -0.238 |
| Kentucky Unemployment Rate | 0.226 | 0.285 | 0.338 | 0.386 | 0.431 |

Forecast Date: March 5, 1979.

# APPENDIX

## KENTUCKY QUARTERLY ECONOMETRIC MODEL TABLES

## TABLE A-1

## KENTUCKY QUARTERLY ECONOMETRIC MODEL
## CONTROL SOLUTION
## SELECTED ECONOMIC INDICATORS

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Personal Income (Millions)[2] | 25393.4 | 25863.5 | 26477.5 | 27161.0 | 28054.1 | 28748.9 | 29672.2 | 30533.3 | 23097.7 | 26223.8 | 29252.1 |
| % Chg.: Ky. Personal Income | 11.84 | 7.61 | 9.84 | 10.73 | 13.82 | 10.28 | 13.48 | 12.12 | 12.34 | 13.53 | 11.55 |
| Wage and Salary Disbursement | 15524.7 | 15839.8 | 16099.2 | 16524.4 | 17189.3 | 17659.0 | 18210.5 | 18822.2 | 13992.2 | 15997.0 | 17970.2 |
| Mfg. Wage & Salaries | 4672.5 | 4769.1 | 4810.1 | 4993.2 | 5317.4 | 5458.9 | 5632.1 | 5837.9 | 4082.7 | 4811.2 | 5561.6 |
| Non-Mfg. Wage & Salaries | 10852.2 | 11070.7 | 11289.1 | 11531.2 | 11871.9 | 12200.1 | 12578.3 | 12984.3 | 9909.5 | 11185.8 | 12408.6 |
| Total Employment (Thousands)[3,4] | 1512.3 | 1518.3 | 1521.4 | 1526.1 | 1532.6 | 1540.3 | 1551.4 | 1560.7 | 1472.7 | 1519.5 | 1546.2 |
| Non-Agri. Wage & Salary Empl. | 1245.0 | 1250.3 | 1252.9 | 1255.9 | 1263.0 | 1270.4 | 1281.1 | 1290.1 | 1217.9 | 1251.0 | 1276.2 |
| % Chg.: Ky. Non-Agri. Empl. | 2.07 | 1.71 | 0.84 | 0.95 | 2.28 | 2.39 | 3.41 | 2.83 | 5.54 | 2.72 | 2.01 |
| Manufacturing Employment | 297.6 | 298.9 | 301.2 | 304.7 | 307.4 | 309.8 | 313.3 | 316.1 | 289.8 | 300.6 | 311.7 |
| Durable Goods | 171.9 | 173.5 | 175.6 | 178.4 | 180.5 | 182.9 | 184.8 | 186.6 | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 125.7 | 125.5 | 125.6 | 126.4 | 126.9 | 127.0 | 128.6 | 129.5 | 124.4 | 125.8 | 128.0 |
| Non-Mfg. Non-Agri. Empl.[5] | 947.4 | 951.3 | 951.7 | 951.1 | 955.5 | 960.6 | 967.8 | 974.0 | 928.1 | 950.4 | 964.5 |
| Civlian Labor Force (Thousands)[6] | 1618.6 | 1627.1 | 1632.5 | 1639.3 | 1647.6 | 1656.4 | 1668.3 | 1678.0 | 1571.7 | 1629.4 | 1662.6 |
| Ky. Unemployment Rate (%)[7] | 5.5 | 5.6 | 5.8 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 | 5.2 | 5.7 | 6.0 |
| Ky. Population (Millions) | 3.544 | 3.553 | 3.563 | 3.574 | 3.585 | 3.596 | 3.609 | 3.621 | 3.504 | 3.558 | 3.603 |

Forecast Date: March 5, 1979

See Footnotes at end of Table A-6.

TABLE A-2

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL SOLUTION
PERSONAL INCOME

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Personal Income (Millions)[2] | 25393.4 | 25863.5 | 26477.5 | 27161.0 | 28054.1 | 28748.9 | 29672.2 | 30533.3 | 23097.7 | 26223.8 | 29252.1 |
| Wage & Salary Disbursements | 15524.7 | 15839.8 | 16099.2 | 16524.4 | 17189.3 | 17659.0 | 18210.5 | 18822.2 | 13992.2 | 15997.0 | 17970.2 |
| Non-Agri. Wages & Salaries | 15355.8 | 15674.3 | 15931.2 | 16356.1 | 17016.0 | 17486.5 | 18039.2 | 18651.6 | 13856.7 | 15829.3 | 17798.3 |
| Manufacturing | 4672.5 | 4769.1 | 4810.1 | 4993.2 | 5317.4 | 5458.9 | 5632.1 | 5837.9 | 4082.7 | 4811.2 | 5561.6 |
| Durable Goods | 2767.6 | 2828.2 | 2858.9 | 2992.0 | 3192.2 | 3254.7 | 3383.5 | 3517.0 | 2433.7 | 2861.7 | 3336.8 |
| Non-Durable Goods | 1904.9 | 1940.8 | 1951.2 | 2001.1 | 2125.3 | 2204.3 | 2248.6 | 2320.9 | 1649.0 | 1949.5 | 2224.8 |
| Mining | 1206.4 | 1206.9 | 1229.5 | 1268.4 | 1387.7 | 1505.8 | 1601.2 | 1691.5 | 915.3 | 1227.8 | 1546.5 |
| Coal Mining | 1136.8 | 1136.3 | 1157.4 | 1194.2 | 1311.9 | 1426.6 | 1518.6 | 1605.1 | 854.4 | 1156.1 | 1465.6 |
| Other Mining | 69.7 | 70.6 | 72.1 | 74.2 | 75.8 | 79.2 | 82.5 | 86.4 | 61.0 | 71.7 | 81.0 |
| Contract Construction | 773.8 | 768.9 | 742.8 | 707.6 | 718.0 | 740.8 | 782.9 | 826.9 | 802.2 | 748.3 | 767.1 |
| Regulated Industries | 1103.0 | 1142.7 | 1179.1 | 1249.9 | 1276.2 | 1280.9 | 1294.5 | 1362.8 | 974.2 | 1168.7 | 1303.6 |
| Wholesale & Retail Trade | 2407.0 | 2478.7 | 2544.7 | 2609.9 | 2683.5 | 2749.8 | 2838.7 | 2910.4 | 2179.0 | 2510.1 | 2795.6 |
| Services | 1907.5 | 1993.9 | 2055.1 | 2110.1 | 2155.9 | 2225.2 | 2305.8 | 2383.6 | 1723.8 | 2016.6 | 2267.6 |
| Finance, Insurance & Real Estate | 510.1 | 521.2 | 539.0 | 548.1 | 570.7 | 581.4 | 605.7 | 615.3 | 483.6 | 529.6 | 593.3 |
| Government | 2775.4 | 2793.1 | 2830.9 | 2868.9 | 2906.5 | 2943.8 | 2978.3 | 3023.1 | 2695.8 | 2817.1 | 2962.9 |
| Civilian Government | 2274.4 | 2299.1 | 2324.9 | 2358.9 | 2391.5 | 2421.8 | 2452.3 | 2491.1 | 2212.3 | 2314.3 | 2439.2 |
| Federal Civilian | 608.6 | 609.9 | 610.3 | 618.6 | 622.6 | 623.8 | 624.7 | 633.4 | 605.8 | 611.9 | 626.1 |
| State & Local Government | 1665.8 | 1689.2 | 1714.7 | 1740.3 | 1768.9 | 1798.0 | 1827.6 | 2857.7 | 1606.5 | 1702.5 | 1813.0 |
| Federal Military | 501.0 | 494.0 | 506.0 | 510.0 | 515.0 | 522.0 | 526.0 | 532.0 | 483.5 | 502.8 | 523.8 |
| Agricultural Wage & Salary[8] | 168.9 | 165.5 | 168.0 | 168.4 | 173.3 | 172.5 | 171.3 | 170.6 | 135.5 | 167.7 | 171.9 |
| Other Labor Income[9] | 1792.6 | 1858.7 | 1914.3 | 1997.1 | 2120.0 | 2214.3 | 2324.4 | 2445.4 | 1602.0 | 1890.7 | 2276.0 |
| Proprietors Net Income[10] | 2514.7 | 2464.1 | 2470.6 | 2499.6 | 2505.7 | 2499.8 | 2468.6 | 2441.0 | 2140.7 | 2487.2 | 2478.8 |
| Non-Farm | 1758.8 | 1758.6 | 1750.8 | 1782.1 | 1798.5 | 1823.3 | 1831.6 | 1840.4 | 1635.0 | 1762.6 | 1823.5 |
| Farm | 756.0 | 705.4 | 719.7 | 717.5 | 707.2 | 676.6 | 637.0 | 600.6 | 505.7 | 724.7 | 655.3 |
| Residence Adjustment[11] | 266.9 | 271.2 | 271.5 | 278.5 | 294.0 | 299.5 | 305.6 | 314.0 | 239.4 | 272.0 | 303.3 |
| Other Income Items | 6422.3 | 6575.0 | 6883.8 | 7045.5 | 7209.4 | 7365.8 | 7683.7 | 7860.7 | 6073.5 | 6731.6 | 7529.9 |
| Property Income[12] | 2789.9 | 2830.7 | 2869.2 | 2894.0 | 2905.2 | 2910.6 | 2934.8 | 2951.4 | 2678.7 | 2846.0 | 2925.5 |
| Transfer Payments[13] | 3632.4 | 3744.2 | 4014.6 | 4151.5 | 4304.2 | 4455.2 | 4748.9 | 4909.3 | 3394.7 | 3885.7 | 4604.4 |
| Less: Personal Contributions Social Insurance[14] | 1127.9 | 1145.1 | 1162.0 | 1184.2 | 1264.4 | 1289.5 | 1320.6 | 1350.0 | 950.1 | 1154.8 | 1306.1 |

Forecast Date: March 5, 1979.

See Footnotes at end of Table A-6.

TABLE A-3

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL SOLUTION
EMPLOYMENT AND HOURS

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Employment (Thousands) | | | | | | | | | | | |
| Total Employment[3,4] | 1512.3 | 1518.3 | 1521.4 | 1526.1 | 1532.6 | 1540.3 | 1551.4 | 1560.7 | 1472.7 | 1519.5 | 1546.2 |
| Non-Agri. Employment | 1412.8 | 1419.9 | 1421.6 | 1424.3 | 1431.2 | 1439.4 | 1451.5 | 1461.6 | 1371.1 | 1419.7 | 1445.9 |
| Wage & Salary Employment | 1245.0 | 1250.3 | 1252.9 | 1255.9 | 1263.0 | 1270.4 | 1281.1 | 1290.1 | 1217.9 | 1251.0 | 1276.2 |
| Manufacturing | 297.6 | 298.9 | 301.2 | 304.7 | 307.4 | 309.8 | 313.3 | 316.1 | 289.8 | 300.6 | 311.7 |
| Durable Goods | 171.9 | 173.5 | 175.6 | 178.4 | 180.5 | 182.9 | 184.8 | 186.6 | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 125.7 | 125.5 | 125.6 | 126.4 | 126.9 | 127.0 | 128.6 | 129.5 | 124.4 | 125.8 | 128.0 |
| Mining | 60.7 | 60.8 | 61.6 | 62.8 | 64.7 | 66.3 | 68.0 | 69.7 | 53.8 | 61.5 | 67.2 |
| Coal Mining | 55.4 | 55.6 | 56.3 | 57.4 | 59.4 | 61.1 | 62.7 | 64.4 | 48.5 | 56.2 | 61.9 |
| Other | 5.2 | 5.2 | 5.3 | 5.4 | 5.3 | 5.3 | 5.3 | 5.4 | 5.3 | 5.3 | 5.3 |
| Contract Construction | 64.4 | 61.7 | 58.4 | 55.6 | 54.9 | 54.6 | 55.0 | 56.4 | 66.1 | 60.0 | 55.2 |
| Regulated Industries | 68.5 | 71.0 | 72.2 | 71.8 | 71.2 | 72.1 | 74.4 | 73.6 | 66.1 | 70.9 | 72.8 |
| Wholesale & Retail Trade | 267.1 | 268.7 | 270.1 | 271.4 | 272.8 | 274.2 | 275.7 | 277.3 | 259.9 | 269.3 | 275.0 |
| Services | 208.0 | 209.6 | 209.4 | 208.5 | 210.2 | 210.6 | 211.2 | 212.6 | 203.8 | 208.9 | 211.1 |
| Finance, Insurance & Real Estate | 46.5 | 46.9 | 47.2 | 47.8 | 48.3 | 48.9 | 49.3 | 49.9 | 46.4 | 47.1 | 49.1 |
| Government | 232.3 | 232.6 | 232.9 | 233.3 | 233.6 | 233.9 | 234.2 | 234.5 | 232.0 | 232.8 | 234.1 |
| Federal | 38.8 | 38.7 | 38.5 | 38.4 | 38.2 | 38.1 | 37.9 | 37.8 | 39.7 | 38.6 | 38.0 |
| State & Local | 193.5 | 193.9 | 194.4 | 194.9 | 195.3 | 195.8 | 196.3 | 196.8 | 192.4 | 194.2 | 196.1 |
| Education | 111.5 | 111.7 | 112.0 | 112.2 | 112.4 | 112.6 | 112.9 | 113.1 | 111.4 | 111.9 | 112.8 |
| Other | 81.9 | 82.2 | 82.4 | 82.7 | 82.9 | 83.2 | 83.4 | 83.7 | 81.0 | 82.3 | 83.3 |
| All Other Non-Agri. Empl.[15] | 167.8 | 169.6 | 168.8 | 168.5 | 168.2 | 169.0 | 170.3 | 171.5 | 153.2 | 168.7 | 169.8 |
| Agricultural | 82.5 | 81.4 | 82.8 | 84.8 | 84.5 | 83.8 | 82.9 | 82.1 | 84.6 | 82.9 | 83.3 |
| Hired Workers | 31.9 | 29.2 | 29.6 | 31.1 | 30.4 | 29.7 | 28.9 | 28.0 | 30.4 | 30.4 | 29.3 |
| Family & Other Unpaid | 50.6 | 52.3 | 53.2 | 53.7 | 54.0 | 54.1 | 54.0 | 54.1 | 54.2 | 52.4 | 54.1 |
| Hours & Manhours[16] | | | | | | | | | | | |
| Average Weekly Hours (hrs/workers/wk) | | | | | | | | | | | |
| Durable Manufacturing | 40.9 | 40.6 | 40.7 | 41.2 | 40.9 | 40.5 | 40.3 | 40.9 | 40.9 | 40.8 | 40.6 |
| Non-Durable Manufacturing | 40.5 | 39.9 | 38.9 | 38.6 | 40.2 | 40.6 | 39.7 | 39.8 | 38.4 | 39.5 | 40.1 |
| Manhours | | | | | | | | | | | |
| Total Manufacturing | 6305.8 | 6264.9 | 6253.9 | 6355.9 | 6488.5 | 6528.0 | 6526.9 | 6651.7 | 5998.8 | 6295.1 | 6548.8 |
| Durable Goods | 3659.2 | 3661.6 | 3712.8 | 3819.7 | 3835.2 | 3847.7 | 3872.2 | 3971.7 | 3514.2 | 3713.3 | 3881.7 |
| Non-Durable Goods | 2646.6 | 2603.2 | 2541.1 | 2536.2 | 2653.3 | 2680.2 | 2654.7 | 2680.0 | 2484.6 | 2581.8 | 2667.1 |
| Days & Man-Days | | | | | | | | | | | |
| Coal Mining Days Worked (units) | 48.9 | 47.6 | 46.8 | 46.2 | 47.9 | 49.5 | 50.2 | 50.5 | 44.2 | 47.4 | 49.5 |
| Coal Mining Man-Days (Thousands) | 10843.2 | 10583.5 | 10526.3 | 10605.3 | 11386.0 | 12099.5 | 12586.7 | 13000.3 | 8603.6 | 10639.6 | 12268.1 |
| Population & Labor Force | | | | | | | | | | | |
| Population | 3.544 | 3.553 | 3.563 | 3.574 | 3.585 | 3.596 | 3.609 | 3.621 | 3.504 | 3.558 | 3.603 |
| Resident Adjusted Labor Force | 1618.6 | 1627.1 | 1632.5 | 1639.3 | 1647.6 | 1656.4 | 1668.3 | 1678.0 | 1571.7 | 1629.4 | 1662.6 |
| Labor Force (Not Res. Adj.) | 1601.6 | 1610.1 | 1615.5 | 1622.3 | 1630.6 | 1639.4 | 1651.3 | 1661.0 | 1554.7 | 1612.4 | 1645.6 |
| Unemployment (Thousands)[17] | 89.3 | 91.9 | 94.1 | 96.2 | 98.0 | 99.1 | 99.9 | 100.3 | 82.0 | 92.9 | 99.3 |
| Unemployment Rate (%)[7] | 5.5 | 5.6 | 5.8 | 5.9 | 5.9 | 6.0 | 6.0 | 6.0 | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

See Footnotes at end of Table A-6.

TABLE A-4

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL SOLUTION
WAGES

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Average Annual Wages (Thousands)[17] | | | | | | | | | | | |
| Manufacturing | 15.7 | 16.0 | 16.0 | 16.4 | 17.3 | 17.6 | 18.0 | 18.5 | 14.1 | 16.0 | 17.8 |
| Durable Goods | 16.1 | 16.3 | 16.3 | 16.8 | 17.7 | 17.8 | 18.3 | 18.8 | 14.7 | 16.4 | 18.2 |
| Non-Durable Goods | 15.2 | 15.5 | 15.5 | 15.8 | 16.7 | 17.4 | 17.5 | 17.9 | 13.2 | 15.5 | 17.4 |
| Non-Manufacturing | 11.5 | 11.6 | 11.9 | 12.1 | 12.4 | 12.7 | 13.0 | 13.3 | 10.7 | 11.8 | 12.9 |
| Non-Agricultural | 11.7 | 11.8 | 12.1 | 12.4 | 12.6 | 12.9 | 13.2 | 13.5 | 10.9 | 12.0 | 13.1 |
| Mining | 19.9 | 19.8 | 20.0 | 20.2 | 21.5 | 22.7 | 23.6 | 24.3 | 16.9 | 20.0 | 23.0 |
| Contract Construction | 12.0 | 12.5 | 12.7 | 12.7 | 13.1 | 13.6 | 14.2 | 14.7 | 12.1 | 12.5 | 13.9 |
| Regulated Industries | 16.1 | 16.1 | 16.3 | 17.4 | 17.9 | 17.8 | 17.4 | 18.5 | 14.7 | 16.5 | 17.9 |
| Wholesale & Retail Trade | 9.0 | 9.2 | 9.4 | 9.6 | 9.8 | 10.0 | 10.3 | 10.5 | 8.4 | 9.3 | 10.2 |
| Services | 9.2 | 9.5 | 9.8 | 10.1 | 10.3 | 10.6 | 10.9 | 11.2 | 8.5 | 9.7 | 10.7 |
| Finance, Insurance & Real Estate | 11.0 | 11.1 | 11.4 | 11.5 | 11.8 | 11.9 | 12.3 | 12.3 | 10.4 | 11.2 | 12.1 |
| Government | 9.8 | 9.9 | 10.0 | 10.1 | 10.2 | 10.4 | 10.5 | 10.6 | 9.5 | 9.9 | 10.4 |
| Federal Civilian | 15.7 | 15.8 | 15.8 | 16.1 | 16.3 | 16.4 | 16.5 | 16.8 | 15.3 | 15.8 | 16.5 |
| State & Local | 8.6 | 8.7 | 8.8 | 8.9 | 9.1 | 9.2 | 9.3 | 9.4 | 8.3 | 8.8 | 9.2 |
| Agriculture[19] | 5.3 | 5.7 | 5.7 | 5.4 | 5.7 | 5.8 | 5.9 | 6.1 | 4.4 | 5.5 | 5.9 |
| Average Hourly Earnings ($/production worker/hour) | | | | | | | | | | | |
| Manufacturing | 7.4 | 7.6 | 7.7 | 7.9 | 8.2 | 8.4 | 8.6 | 8.8 | 6.8 | 7.6 | 8.5 |
| Durable Goods | 7.6 | 7.7 | 7.7 | 7.8 | 8.3 | 8.5 | 8.7 | 8.9 | 6.9 | 7.7 | 8.6 |
| Non-Durable Goods | 7.2 | 7.5 | 7.7 | 7.9 | 8.0 | 8.2 | 8.5 | 8.7 | 6.6 | 7.6 | 8.3 |
| Average Daily Earnings[20] ($/employee/day) | | | | | | | | | | | |
| Coal Mining | 104.8 | 107.4 | 109.9 | 112.6 | 115.2 | 117.9 | 120.7 | 123.5 | 98.8 | 108.7 | 119.3 |

Forecast Date: March 5, 1979.

See Footnotes at end of Table A-6.

TABLE A-5

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: ELIMINATE UTILITY TAX
SELECTED ECONOMIC INDICATORS

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Personal Income (Millions)[2] | 25393.4 | 25863.5 | 26424.9 | 27107.2 | 27999.2 | 28693.3 | 29616.0 | 30477.0 | 23097.7 | 26197.3 | 29196.4 |
| % Chg.: Ky. Personal Income | 11.84 | 7.61 | 8.97 | 10.73 | 13.83 | 10.29 | 13.50 | 12.15 | 12.34 | 13.42 | 11.45 |
| Wage and Salary Disbursement | 15524.7 | 15839.8 | 16096.4 | 16520.4 | 17184.3 | 17653.4 | 18204.4 | 18816.0 | 13992.2 | 15995.3 | 17964.5 |
| Mfg. Wage & Salaries | 4672.5 | 4769.1 | 4810.1 | 4993.2 | 5317.3 | 5458.6 | 5631.6 | 5837.3 | 4082.7 | 4811.2 | 5561.2 |
| Non-Mfg. Wage & Salaries | 10852.2 | 11070.7 | 11286.3 | 11527.2 | 11867.1 | 12194.8 | 12572.8 | 12978.7 | 9909.5 | 11184.1 | 12403.4 |
| Total Employment (Thousands)[3,4] | 1512.3 | 1518.3 | 1521.3 | 1525.9 | 1532.3 | 1539.9 | 1551.1 | 1560.4 | 1472.7 | 1519.4 | 1545.9 |
| Non-Agri. Wage & Salary Empl. | 1245.0 | 1250.3 | 1252.7 | 1255.6 | 1262.6 | 1270.1 | 1280.8 | 1289.7 | 1217.9 | 1250.9 | 1275.8 |
| % Chg.: Ky. Non-Agri. Empl. | 2.07 | 1.71 | 0.80 | 0.91 | 2.26 | 2.38 | 3.41 | 2.84 | 5.54 | 2.71 | 1.99 |
| Manufacturing Employment | 297.6 | 298.9 | 301.2 | 304.7 | 307.4 | 309.8 | 313.4 | 316.1 | 289.8 | 300.6 | 311.7 |
| Durable Goods | 171.9 | 173.5 | 175.6 | 178.4 | 180.5 | 182.9 | 184.8 | 186.6 | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 125.7 | 125.5 | 125.6 | 126.4 | 126.9 | 127.0 | 128.6 | 129.5 | 124.4 | 125.8 | 128.0 |
| Non-Mfg. Non-Agri. Empl.[5] | 947.4 | 951.3 | 951.5 | 950.9 | 955.2 | 960.2 | 967.4 | 973.6 | 928.1 | 950.3 | 964.1 |
| Civilian Labor Force (Thousands)[6] | 1618.6 | 1627.1 | 1632.4 | 1639.1 | 1647.3 | 1656.1 | 1668.0 | 1677.6 | 1571.7 | 1629.3 | 1662.3 |
| Ky. Umemployment Rate (%)[7] | 5.5 | 5.6 | 5.8 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

See Footnotes at end of Table A-6.

TABLE A-6

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: ADMINISTRATION'S GRANTS-IN-AID PROPOSAL
SELECTED ECONOMIC INDICATORS

| Description | Quarterly Forecast Data[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1979.1 | 1979.2 | 1979.3 | 1979.4 | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1978 | 1979 | 1980 |
| Personal Income (Millions)[2] | 25389.3 | 25855.2 | 26464.8 | 27142.6 | 28030.5 | 28719.7 | 29636.5 | 30490.7 | 23097.7 | 26213.0 | 29219.3 |
| % Chg.: Ky. Personal Income | 11.77 | 7.54 | 9.77 | 10.65 | 13.74 | 10.20 | 13.39 | 12.04 | 12.34 | 13.49 | 11.47 |
| Wage and Salary Disbursement | 15520.3 | 15830.8 | 16085.6 | 16505.1 | 17164.4 | 17628.9 | 18174.3 | 18779.9 | 13992.2 | 15985.5 | 17936.9 |
| Mfg. Wage & Salaries | 4672.5 | 4769.1 | 4810.2 | 4993.3 | 5317.5 | 5459.0 | 5632.1 | 5837.8 | 4082.7 | 4811.3 | 5561.6 |
| Non-Mfg. Wage & Salaries | 10847.8 | 11061.7 | 11275.5 | 11511.8 | 11847.1 | 12169.9 | 12542.2 | 12942.1 | 9909.5 | 11174.2 | 12375.3 |
| Total Employment (Thousands)[3,4] | 1511.8 | 1517.3 | 1519.9 | 1524.1 | 1530.1 | 1537.2 | 1547.8 | 1556.6 | 1472.7 | 1518.3 | 1542.9 |
| Non-Agri. Wage & Salary Empl. | 1244.5 | 1249.3 | 1251.4 | 1253.8 | 1260.4 | 1267.3 | 1277.5 | 1285.9 | 1217.9 | 1249.7 | 1272.8 |
| % Chg.: Ky. Non-Agri. Empl. | 1.91 | 1.55 | 0.68 | 0.79 | 2.11 | 2.22 | 3.25 | 2.67 | 5.54 | 2.61 | 1.85 |
| Manufacturing Employment | 297.6 | 298.9 | 301.2 | 304.7 | 307.4 | 309.8 | 313.3 | 316.1 | 289.8 | 300.6 | 311.7 |
| Durable Goods | 171.9 | 173.5 | 175.6 | 178.4 | 180.5 | 182.9 | 184.7 | 186.6 | 165.4 | 174.8 | 183.7 |
| Non-Durable Goods | 125.7 | 125.5 | 125.6 | 126.4 | 126.9 | 126.9 | 128.6 | 129.5 | 124.4 | 125.8 | 128.0 |
| Non-Mfg., Non-Agri. Empl.[5] | 946.9 | 950.3 | 950.2 | 949.1 | 953.0 | 957.5 | 964.2 | 969.9 | 928.1 | 949.1 | 961.1 |
| Civilian Labor Force (Thousands)[6] | 1618.1 | 1626.2 | 1631.1 | 1637.4 | 1645.2 | 1653.5 | 1664.9 | 1674.0 | 1571.7 | 1628.2 | 1659.4 |
| Ky. Umemployment Rate (%)[7] | 5.5 | 5.7 | 5.8 | 5.9 | 0.0 | 6.0 | 6.0 | 6.0 | 5.2 | 5.7 | 6.0 |

Forecast Date: March 5, 1979.

[1] Unless indicated, all quarterly forecast projections are computed at an annual rate (i.e., multiplied quarterly data by four).

[2] Personal Income is the sum of components (indented) under personal income in Table A-2.

[3] Total employment is comprised of all paid workers, unpaid workers with fifteen or more hours per week in family operated enterprises, and persons who have jobs but who are temporarily not working due to illness, personal reasons, weather, vacation, or labor management disputes. For detailed information, see Charles G. Renfro and Paul A. Coomes, *Kentucky Economic Information System User Manual* (Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, 1977), or *BLS Handbook of Methods*, U.S. Department of Labor, Bureau of Labor Statistics (Washington, D.C.: U.S. Government Printing Office).

[4] Total employment is not equal to the sum of the components of Table A-3, because total employment figures are on a place-of-residence basis, whereas, employment components are on a place-of-work basis.

[5] The breakdown of agricultural, nonagricultural, and manufacturing employment is shown in Table A-3.

[6] Civilian Labor Force includes all civilian residents, sixteen years of age or over, who are either employed or reported to be actively seeking work (see Footnote 4).

[7] The unemployment rate is computed as the number of unemployed as a percent of the civilian labor force.

[8]Agricultural wage and salary income represents the income of hired farm workers. This figure does not include the income of farm proprietors and unpaid family workers.

[9]Other labor income includes such items as employer contributions to private pension funds, health, and welfare plans.

[10]Proprietors' net income measures the net business earnings of unincorporated enterprises, consisting of sole proprietors, partnerships, and producers' cooperatives (farmers, independent professional practitioners–e.g., physicians, lawyers–nonfarm entrepreneurs, and other self-employed).

[11]A residence adjustment is made to personal income in order to account for the net out-of-state wage and salary earnings of Kentucky residents. However, the 1978 value of residence adjustment in Table A-2 is not the value published by the Bureau of Economic Analysis. BEA's 1978 figure is believed to be an understatement of Kentucky residents' out-of-state earnings.

[12]Property income consists of rental income, dividends, and interest payments to persons, nonprofit institutions, and private pensions and trust funds.

[13]Transfer payments comprise receipts from government and business (for which no services are rendered) to persons, nonprofit institutions, and private pension and trust funds. Government transfer payments include social security payments, veteran benefits, welfare payments, and unemployment compensation, etc. Business transfer payments include gifts to nonprofit institutions and consumer bad debts, etc.

[14]Personal contributions for social insurance are excluded from personal income. While these contributions are part of an individual's earnings, they are not received by that individual in the current period.

[15]All other nonagricultural employment includes nonagricultural self-employed and unpaid family workers, plus domestic workers in private households.

[16]Hours, man-hours, days, and man-days refer only to those employees who were *actually* working during the given time period.

[17]Unemployment is comprised of persons reported as not working but looking for work, persons laid-off work but waiting to report back to work, and persons waiting to report to a new salary or wage job. For more detail, see the *Kentucky Economic Information System User Manual* or the *BLS Handbook of Methods.*

[18]Historically, figures for average annual wages are computed by dividing the wage and salary income originating in each industry by the wage and salary employment in that industry. Projections are on the same conceptual basis.

[19]Agricultural annual average wages refer only to earnings of hired farm workers. Farm proprietors or family workers are not included.

[20]Conceptually, coal mining average daily earnings are computed by dividing income originating in coal mining by the man-days worked in the industry. Consequently, the employees include all wage and salary workers, not just production workers.

# III. Kentucky's Economy: How Does It Compare?

by Lawrence K. Lynch

## Introduction

Amid the turmoil generated by Kentucky's special legislative session in 1978-79 and the gubernatorial election in 1979, economic questions are of major importance. How is Kentucky's economy performing? Is the economy fully developed? Can Kentucky afford to cut taxes and limit government spending? Can Kentucky afford not to? This paper presents information that may help to answer some of these questions.

The purposes of this paper are to (1) compare the economic performance of Kentucky in the 1970s with that of the United States and several regions within the U.S.; and (2) examine and compare the public sector performance of the regions. Economic performance is measured by population, total and per capita income, and employment; public sector performance is measured by state and local government revenues and expenditures. The regions selected for comparison are the U.S. as a whole, the Sunbelt, the Northern Industrial Tier, and, for completeness, the Remainder of the U.S.

In selecting the states to be classified as "Sunbelt" or "Northern Industrial Tier" states, we have followed Jusenius and Ledebur.[1] The Sunbelt consists of the West South Central, East South Central and South Atlantic census regions, except that Maryland, Delaware and Washington, D.C. (and Kentucky) have been excluded. The western states of Arizona, New Mexico, and California are not included, partly because their economies differ markedly from the other Sunbelt states, and partly because of a desire to focus on the southeastern states. The Northern Industrial Tier consists of the East North Central, Middle Atlantic and New England census regions, except that Maine, Vermont, and New Hampshire have been excluded since they are not highly industrialized. The Remainder of the U.S., then, consists mostly of the western states, plus those portions of the eastern states excluded from the Sunbelt and Northern Industrial Tier. Figure 1 identifies the study regions.

The comparative analysis presented in this paper provides insights into several issues of interest to Kentuckians. First, it tends to show that on the dimension of economic performance, Kentucky has done very well in the 1970s, although Kentucky's economy is still not operating at as high a level as might be possible. Second, the public sector analysis shows that, while Kentucky has a relatively low tax burden, it still manages to support certain critical public sector activities strongly, at least in relation to personal income.

## Comparative Economic Performance

Three broad measures of economic performance were first examined—population, personal income, and per capita income; on all three, both Kentucky and the Sunbelt clearly outperformed the Northern Industrial Tier and the nation as a whole in the 1970-77 period. A more detailed analysis of employment growth by industry in the regions was undertaken in order to uncover some of the structural differences that may account for growth differentials.

For analytical reasons, the 1970-77 period was broken into two shorter periods: 1970 to 1975, the bottom of the recession induced by the energy crisis; and 1975 to 1977, the economic recovery.

### Population

As Table 1 and Figure 2 show, U.S. population grew by 6.1 percent between 1970 and 1977, increasing to a resident population of 216,320,000. The annual rate of growth was slightly lower in 1975-77 than in 1970-75 due to declining birth rates.

Kentucky's population grew by 7.0 percent over the period; this rate was only slightly faster than the U.S. average. Population growth accelerated in the 1975-77 period, as in-migration based upon the resurgence of the coal industry offset declining birth rates. It is significant that net migration for Kentucky was positive in the 1970s—reversing a pattern of out-migration that has persisted for decades.

Sunbelt population grew by 11.8 percent between 1970 and 1977, and experienced a slower annual rate of growth in 1975-77 than in 1970-75. The Sunbelt contained 26.8 percent of the nation's population in 1970, 27.8 percent in 1975, and 28.2 percent in 1977. Of the total U.S. population gain of 12,521,000 over the entire period, the Sunbelt's share was 6,434,000, or 51 percent. Moreover, every Sunbelt state outgrew the U.S. average, with growth rates ranging from 6.4 percent for West Virginia to 23.4 percent for Florida.

Population in the Northern Industrial Tier grew by

**Figure 1. Census Regions and Study Regions**

Source: U.S. Department of Commerce, Bureau of the Census.

TABLE 1

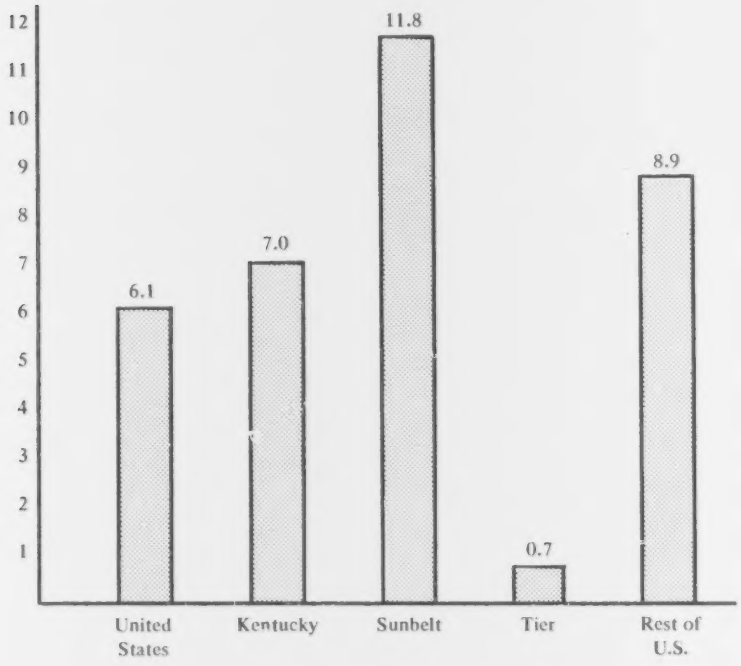
PERSONAL INCOME, PER CAPITA INCOME, AND POPULATION; KENTUCKY, SUNBELT, NORTHERN INDUSTRIAL TIER, AND UNITED STATES; 1970, 1975, AND 1977

| Region | 1970 | | | 1975 | | | 1977 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Personal Income ($ millions) | Per Capita Income | Population (000) | Total Personal Income ($ millions) | Per Capita Income | Population (000) | Total Personal Income ($ millions) | Per Capita Income | Population (000) |
| Kentucky | $ 9,937 | $3,076 | 3,231 | $ 16,551 | $4,887 | 3,387 | $ 20,561 | $5,945 | 3,458 |
| Sunbelt | 179,103 | 3,284 | 54,545 | 305,832 | 5,162 | 59,242 | 380,023 | 6,232 | 60,979 |
| Tier | 369,800 | 4,237 | 87,289 | 546,263 | 6,203 | 88,060 | 651,305 | 7,408 | 87,919 |
| Rest of U.S. | 234,263 | 3,989 | 58,734 | 379,800 | 6,093 | 62,331 | 466,501 | 7,293 | 63,964 |
| United States | 793,485 | 3,893 | 203,799 | 1,248,446 | 5,861 | 213,020 | 1,518,390 | 7,019 | 216,320 |

SOURCE: Bureau of Economic Analysis, U.S. Department of Commerce, unpublished data, August 1978.

FIGURE 2

PERCENT CHANGE IN POPULATION, 1970-77




only 0.7 percent between 1970 and 1977, and actually declined in 1975-77. None of the Tier states grew as fast as the nation (Wisconsin grew fastest, by 5.1 percent between 1970 and 1977), and three experienced population declines–New York, Rhode Island, and Pennsylvania. The Northern Industrial Tier's share of U.S. population was 42.8 percent in 1970, 41.3 percent in 1975, and 40.6 percent in 1977. The Tier's total increase of 630,000 persons over the 1970-77 period was only 5.0 percent of the total U.S. increase.

The population in the Remainder of the U.S. grew by 8.9 percent between 1970 and 1977, which was about 3 percent slower than the Sunbelt, but faster than Kentucky's rate. Growth for the Remainder of the U.S. accelerated slightly in the 1975-77 period, due primarily to in-migration to the western states.

## Personal Income

Personal income consists of wages and salaries, fringe benefits, rents, interest income, net income of farm and nonfarm proprietors, dividends, and transfer payments received by individuals, with only contributions for social insurance deducted. It is measured on a place-of-residence basis. Thus it is a good measure of what residents of a given region have available to spend on all public and private goods and services.

U.S. personal income grew from $793 billion to $1,518 billion between 1970 and 1977 (see Table 1), nearly doubling over the seven-year period. However, the increase in the Consumer Price Index over the same period was 56.1 percent[2] so the growth in "real" income was only 22.6 percent. The annual rate of growth of total personal income was slightly higher in 1970-75 than in 1975-77, but annual growth after adjustment for inflation was twice as high in the latter period.

Kentucky's personal income grew by 106.9 percent over the 1970-77 period, a rate that exceeded the U.S. average and the percentages for all regions except the Sunbelt. Total personal income in the Sunbelt grew by 112.2 percent between 1970 and 1977, increasing to about $380 billion. The Sunbelt's share of the U.S. total rose from 22.6 percent in 1970 to 24.5 percent in 1975, and increased to 25.0 percent in 1977. Total personal income in the Northern Industrial Tier rose by 76.1 percent, to $651 billion; however, its share of the U.S. total declined from 46.6 percent in 1970 to 43.8 percent in 1975, and decreased to 42.9 percent in 1977.

## Per Capita Income

Per capita income is a frequently used but flawed measure of individual well-being in a region. Like total personal income, it does not adjust for interregional price level differences. It also does not adjust for family size differences. Most importantly, however, per capita income provides no information about the *distribution* of income among rich and poor, and among families or different sizes.

For the U.S., per capita income rose from $3,893 in 1970 to $7,019 in 1977 (Table 1), an increase of 80.3 percent (or only 15.5 percent when adjusted for inflation). Again, the annual increase was about the same in 1975-77 as in 1970-75, but more of the gain during the early period was attributable to inflation.

Kentucky's per capita income grew faster than that of any other region–by 93.3 percent.[3] As Figure 3 shows, however, Kentucky still trails the other regions in its level of per capita income, which was only 84.7 percent of the U.S. average in 1977. Per capita income in the Sunbelt grew by 90.0 percent over the 1970-77 period, to $6,232, or 88.8 percent of the U.S. average. Per capita income in the Northern Industrial Tier grew by only 74.8 percent between 1970 and 1977, to $7,408. Relative to the U.S., the Tier's average per capita income declined from 108.8 percent in 1970 to 105.8 percent in 1975, and to 105.5 percent in 1977.

The picture that emerges from this overview of broad economic measures is that Kentucky and the Sunbelt are less developed, in terms of per capita income, than the Northern Industrial Tier, the Remainder of the U.S., or the U.S. average; however, both Kentucky and the Sunbelt area are gaining rapidly. Moreover, if regional price level differences (which are poorly measured) were considered, Kentucky's $1,463 shortfall in per capita income, as compared with the Northern Industrial Tier, would diminish.

## Employment

As shown in Table 2a, for the U.S. as a whole, total employment (excluding self-employed) grew by 14.4 percent, to 86.3 million workers, between 1970 and 1977. The effect of the 1973-75 recession can be seen by examining the 1975 data: three nonagricultural industries–contract construction, manufacturing, and transportation and public utilities–actually lost employment between 1970 and 1975, and total nonagricultural employment grew by only 8.6 percent for the five-year period compared with 6.6 percent for the two-year 1975-77 period. For the entire period, the fastest growing industries were: mining, 33.4 percent; services, 31.9 percent; finance, insurance, and real estate, 22.3

FIGURE 3

PER CAPITA INCOME AS A PERCENT OF THE UNITED STATES, 1970 AND 1977

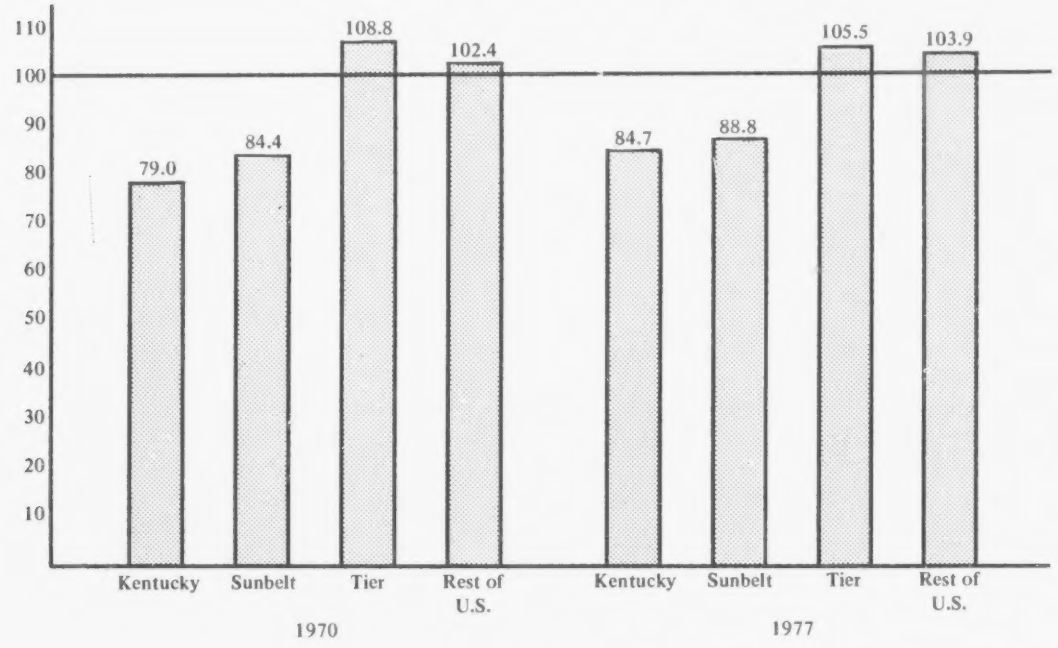


TABLE 2a

EMPLOYMENT, UNITED STATES, 1970, 1975 AND 1977
(Thousands of Workers)

| Industry Group | 1970 | Percent of Total | 1975 | Percent Change 1970-75 | 1977 | Percent of Total | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|---|---|
| Mining | 623 | *0.8* | 745 | 19.6 | 831 | *1.0* | 11.5 | 33.4 |
| Contract Construction | 3,536 | *4.7* | 3,512 | -0.7 | 3,844 | *4.5* | 9.5 | 8.7 |
| Manufacturing | 19,349 | *25.6* | 18,347 | -5.2 | 19,554 | *22.7* | 6.6 | 1.1 |
| Transportation and Public Utilities | 4,504 | *6.0* | 4,498 | -0.1 | 4,589 | *5.3* | 2.0 | 1.9 |
| Wholesale and Retail Trade | 15,040 | *19.9* | 17,000 | 13.0 | 18,292 | *21.2* | 7.6 | 21.6 |
| Finance, Insurance and Real Estate | 3,687 | *4.9* | 4,223 | 14.5 | 4,508 | *5.2* | 6.7 | 22.3 |
| Services | 11,621 | *15.4* | 14,006 | 20.5 | 15,333 | *17.8* | 9.5 | 31.9 |
| Government | 12,561 | *16.6* | 14,720 | 17.2 | 15,190 | *17.6* | 3.2 | 20.9 |
| Total Nonagricultural | 70,920 | *94.0* | 77,051 | 8.6 | 82,142 | *95.2* | 6.6 | 15.8 |
| Agriculture | 4,529 | *6.0* | 4,357 | -3.8 | 4,152 | *4.8* | -4.7 | -8.3 |
| Total Employment* | 75,449 | *100.0* | 81,408 | 7.9 | 86,294 | *100.0* | 6.0 | 14.4 |

*Excludes self-employment.

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, *Monthly Labor Review*, Vol. 101, No. 5, May 1978, Table 8, p. 85; and U.S. Department of Agriculture, *Farm Labor*, January 1973, February 1976, and February 1978.

percent; wholesale and retail trade, 21.6 percent, and government, 20.9 percent. Only agriculture had a decline in employment over the 1970-77 period.

Kentucky's total employment grew by 21.9 percent between 1970 and 1977, as shown in Table 2b. Only contract construction and agricultural employment declined in the 1970-75 period, indicating that the recession had much less impact in Kentucky than in other parts of the nation. The fastest growing Kentucky industries over the entire period were: mining, 71.4 percent; wholesale and retail trade, 37.5 percent; services, 37.4 percent; finance, insurance and real estate, 30.6 percent; and government, 29.0 percent.

Employment in the Sunbelt grew only slightly faster than in Kentucky between 1970 and 1977, rising from 19.0 million workers to 23.3 million, for an increase of 22.9 percent (Table 2c). The recession of 1973-75 had much less impact on the Sunbelt than on the nation; no Sunbelt industry except agriculture lost employment between 1970 and 1975, and total employment grew nearly twice as fast in the Sunbelt as in the U.S. Rapidly growing industries in the Sunbelt over the entire period were the same as for the U.S., but their rankings differed. Services grew fastest, by 45.4 percent, and were followed by mining, 35.4 percent; finance, insurance and real estate, 34.8 percent; wholesale and retail trade, 34.2 percent; and government, 28.3 percent.

Total employment in the Northern Industrial Tier grew by only 5.0 percent between 1970 and 1977, rising to 35.2 million workers (Table 2d). The recession of 1973-75 devastated the Tier; contract construction employment declined by 13.6 percent between 1970 and 1975; manufacturing employment decreased by 11.7 percent; and transportation and public utility employment declined by 5.7 percent. Moreover, none of these three industries had recovered to their 1970 employment levels by 1977. No Northern Industrial Tier industry outgrew the national average over the 1970-77 period. The fastest growing sectors were: services, 22.0 percent; mining, 14.2 percent; government, 13.1 percent; and wholesale and retail trade, 11.5 percent.

Total employment in the regions designated as the Remainder of the United States (Table 2e) grew almost as fast as in the Sunbelt and Kentucky, increasing by 20.9 percent between 1970 and 1977. The effects of the recession were moderate in this region also—even agricultural employment grew between 1970 and 1975, before resuming its secular decline. The fastest growing industries were the same five that experienced rapid growth in the other regions.

In terms of employment, then, as well as population and income, the so-called Sunbelt phenomenon seems to characterize all regions except the northeast and midwest. It appears that economic activity is shifting out of its traditional stronghold in the northeast and midwest to all other regions. This shift is not new—it has been going on for decades—but it does seem to have intensified

TABLE 2b

EMPLOYMENT, KENTUCKY, 1970, 1975 AND 1977
(Thousands of Workers)

| Industry Group | 1970 | Percent of Total | 1975 | Percent Change 1970-75 | 1977 | Percent of Total | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|---|---|
| Mining | 28.0 | *2.6* | 44.8 | 60.0 | 48.0 | *3.7* | 7.1 | 71.4 |
| Contract Construction | 47.6 | *4.5* | 47.0 | -1.3 | 60.4 | *4.7* | 28.5 | 26.9 |
| Manufacturing | 252.9 | *23.8* | 254.2 | 0.5 | 283.2 | *21.9* | 11.4 | 12.0 |
| Transportation and Public Utilities | 59.0 | *5.6* | 59.5 | 0.8 | 64.2 | *5.0* | 7.9 | 8.8 |
| Wholesale and Retail Trade | 180.0 | *16.9* | 214.0 | 18.9 | 247.5 | *19.1* | 15.7 | 37.5 |
| Finance, Insurance, and Real Estate | 35.6 | *3.4* | 41.7 | 17.1 | 46.5 | *3.6* | 11.5 | 30.6 |
| Services | 134.4 | *12.7* | 165.6 | 23.2 | 184.7 | *14.3* | 11.5 | 37.4 |
| Government | 172.6 | *16.3* | 214.9 | 24.5 | 222.7 | *17.2* | 3.6 | 29.0 |
| Total Nonagricultural | 910.1 | *85.8* | 1,041.7 | 14.5 | 1,157.2 | *89.5* | 11.1 | 27.2 |
| Agriculture | 152.0 | *14.3* | 140.0 | -7.9 | 137.0 | *10.6* | -2.1 | -9.9 |
| Total Employment* | 1,062.1 | *100.1* | 1,181.7 | 11.3 | 1,294.2 | *100.1* | 9.5 | 21.9 |

*Excludes self-employment.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, *Employment and Earnings, States and Areas, 1939-75*, Bulletin 1370-12, U.S. Government Printing Office, Washington, D.C., 1977; U.S. Department of Labor, *Farm Labor*, January 1973, February 1976 and February 1978; and Kentucky Department for Human Resources, unpublished data for 1977.

TABLE 2c

EMPLOYMENT, SUNBELT, 1970, 1975 AND 1977
(Thousands of Workers)

| Industry Group | 1970 | Percent of Total | 1975 | Percent Change 1970-75 | 1977 | Percent of Total | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|---|---|
| Mining | 306.2 | *1.6* | 361.4 | 18.0 | 414.7 | *1.8* | 14.7 | 35.4 |
| Contract Construction | 1,028.0 | *5.4* | 1,180.4 | 14.8 | 1,306.8 | *5.6* | 10.7 | 27.1 |
| Manufacturing | 4,525.4 | *23.9* | 4,599.2 | 1.6 | 5,084.9 | *21.8* | 10.6 | 12.4 |
| Transportation and Public Utilities | 1,113.9 | *5.9* | 1,219.0 | 9.4 | 1,279.9 | *5.5* | 5.0 | 14.9 |
| Wholesale and Retail Trade | 3,693.3 | *19.5* | 4,494.4 | 21.7 | 4,954.9 | *21.3* | 10.2 | 34.2 |
| Finance, Insurance, and Real Estate | 812.6 | *4.3* | 1,053.7 | 29.7 | 1,095.2 | *4.7* | 3.9 | 34.8 |
| Services | 2,497.3 | *13.2* | 3,276.0 | 31.2 | 3,630.7 | *15.6* | 10.8 | 45.4 |
| Government | 3,290.3 | *17.4* | 3,994.8 | 21.4 | 4,220.6 | *18.1* | 5.7 | 28.3 |
| Total Nonagricultural | 17,267.5 | *91.2* | 20,178.8 | 16.9 | 21,987.0 | *94.4* | 9.0 | 27.3 |
| Agriculture | 1,684.0 | *8.9* | 1,421.9 | -15.6 | 1,306.7 | *5.6* | -8.1 | -22.4 |
| Total Employment* | 18,951.5 | *100.1* | 21,600.7 | 14.0 | 23,293.7 | *100.0* | 7.8 | 22.9 |

*Excludes self-employment.

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, *Employment and Earnings, States and Areas, 1939-75*, Bulletin 1370-12, 1977 and *Employment and Earnings*, April 1977-June 1978, Table B-8, U.S. Government Printing Office, Washington, D.C.; and U.S. Department of Agriculture, *Farm Labor*, January 1973, February 1976, and February 1978.

TABLE 2d

EMPLOYMENT, NORTHERN INDUSTRIAL TIER, 1970, 1975, AND 1977
(Thousands of Workers)

| Industry Group | 1970 | Percent of Total | 1975 | Percent Change 1970-75 | 1977 | Percent of Total | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|---|---|
| Mining | 116.2 | *0.3* | 132.0 | 13.6 | 132.7 | *0.4* | 0.5 | 14.2 |
| Contract Construction | 1,354.5 | *4.0* | 1,170.6 | -13.6 | 1,190.1 | *3.4* | 1.7 | -12.1 |
| Manufacturing | 10,392.0 | *31.0* | 9,176.1 | -11.7 | 9,574.6 | *27.2* | 4.3 | -7.9 |
| Transportation and Public Utilities | 1,979.9 | *5.9* | 1,867.8 | -5.7 | 1,861.6 | *5.3* | -0.3 | -6.0 |
| Wholesale and Retail Trade | 6,616.4 | *19.7* | 7,038.1 | 6.4 | 7,378.1 | *20.9* | 4.8 | 11.5 |
| Finance, Insurance, and Real Estate | 1,768.2 | *5.3* | 1,886.8 | 6.7 | 1,939.1 | *5.5* | 2.8 | 9.7 |
| Services | 5,275.6 | *15.7* | 6,061.1 | 14.9 | 6,438.3 | *18.3* | 6.2 | 22.0 |
| Government | 5,004.8 | *14.9* | 5,592.1 | 11.7 | 5,661.7 | *16.1* | 1.2 | 13.1 |
| Total Nonagricultural | 32,507.6 | *96.9* | 32,924.7 | 1.3 | 34,178.2 | *97.0* | 3.8 | 5.1 |
| Agriculture | 1,031.5 | *3.1* | 1,064.4 | 3.2 | 1,052.6 | *3.0* | -1.1 | 2.0 |
| Total Employment* | 33,539.1 | *100.0* | 33,989.1 | 1.3 | 35,230.8 | *100.0* | 3.7 | 5.0 |

*Excludes self-employment.

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, *Employment and Earnings, States and Areas, 1939-75,* Bulletin 1370-12, 1977 and *Employment and Earnings,* April 1977-June 1978, Table B-8, U.S. Government Printing Office, Washington, D.C.; and U.S. Department of Agriculture, *Farm Labor,* January 1973, February 1976, and February 1978.

TABLE 2e

EMPLOYMENT, REST OF THE UNITED STATES, 1970, 1975 AND 1977
(Thousands of Workers)

| Industry Group | 1970 | Percent of Total | 1975 | Percent Change 1970-75 | 1977 | Percent of Total | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|---|---|
| Mining | 172.6 | *0.8* | 206.8 | 19.8 | 235.6 | *0.9* | 13.9 | 36.5 |
| Contract Construction | 1,105.9 | *5.1* | 1,114.0 | 0.7 | 1,286.7 | *4.9* | 15.5 | 16.3 |
| Manufacturing | 4,178.7 | *19.1* | 4,317.5 | 3.3 | 4,611.3 | *17.4* | 6.8 | 10.4 |
| Transportation and Public Utilities | 1,351.2 | *6.2* | 1,351.7 | 0.0 | 1,383.3 | *5.2* | 2.3 | 2.4 |
| Wholesale and Retail Trade | 4,550.3 | *20.8* | 5,253.5 | 15.5 | 5,711.5 | *21.6* | 8.7 | 25.5 |
| Finance, Insurance, and Real Estate | 1,070.6 | *4.9* | 1,241.0 | 15.9 | 1,427.2 | *5.4* | 15.0 | 33.3 |
| Services | 3,713.2 | *17.0* | 4,503.3 | 21.3 | 5,079.3 | *19.2* | 12.8 | 36.8 |
| Government | 4,093.3 | *18.7* | 4,918.2 | 20.2 | 5,085.0 | *19.2* | 3.4 | 24.2 |
| Total Nonagricultural | 20,234.8 | *92.6* | 22,905.8 | 13.2 | 24,819.6 | *93.8* | 8.4 | 22.7 |
| Agriculture | 1,661.5 | *7.6* | 1,730.7 | 4.2 | 1,655.7 | *6.2* | -4.3 | -0.3 |
| Total Employment* | 21,896.3 | *100.2* | 24,636.5 | 12.5 | 26,475.3 | *100.0* | 7.5 | 20.9 |

*Excludes self-employment.

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, *Employment and Earnings, States and Areas, 1939-75,* Bulletin 1370-12, 1977 and *Employment and Earnings,* April 1977-June 1978, Table B-8, U.S. Government Printing Office, Washington, D.C.; and U.S. Department of Agriculture, *Farm Labor,* January 1973, February 1976, and February 1978.

in the 1970s.

## Employment/Population Ratios

A gross measure of labor force participation is the ratio of total employment to population. As shown in Table 3, for the U.S., this ratio increased from .370 in 1970 to .399 in 1977 (recall that self-employed are excluded from the employment measure). The ratios in the Northern Industrial Tier and the Remainder of the U.S. were higher than the U.S. average and also grew during the period; the ratios in Kentucky and the Sunbelt were lower, but grew faster than in the U.S.

This indicates that there are relatively more dependents (minor children, the elderly, handicapped, people on welfare, and the unemployed) in the Sunbelt than in the Northern Industrial Tier—a finding that may be surprising to some. The growth of labor force participation in all regions during the period has been attributed to demographic factors (the postwar "baby boom" people having reached working age) and to increased female labor force participation (resulting from the women's movement, inflation, and the postponement of childbirth).[4]

## Employment Structure

Referring again to Tables 2a-2e, columns 2 and 6 show the percentage distributions of employment in the five regions in 1970 and in 1977. Analysis of these data may indicate some structural reasons for the growth differentials of the 1970s.

Mining represented less than 1 percent of U.S. employment in 1970; however, due to the energy crisis, which raised the prices of coal and petroleum products, mining became the fastest growing industry in the nation between 1970 and 1977. Kentucky and the Sunbelt, with much larger initial proportions of employment in mining than the Northern Industrial Tier, benefited most from this growth. Mining still represents only a small share of total employment, however.

The 1970s witnessed a shift from goods producing to service producing industries in the United States. Construction, manufactuirng, and agriculture each had declining shares of total employment, while trade, finance, services, and government each had increasing shares. According to the Clark-Fisher hypothesis of economic development, this shift represented a maturing of the U.S. economy and should have led to an increase in real per capita income.[5] It was shown earlier that real per capita income did in fact increase between 1970 and 1977.

Kentucky's goods producing employment share declined from 45.2 percent to 40.9 percent between 1970 and 1977, but the decline would have been greater if mining employment had not surged. Kentucky's share of manufacturing employment throughout the period was below the U.S. average, while agriculture and mining shares exceeded the U.S. average.

The Sunbelt also enjoyed a shift from goods production to service production in the 1970s. The Sunbelt actually began the 1970s with a smaller than average proportion of employment in manufacturing; only higher proportions in agriculture, construction, and mining made the Sunbelt more goods oriented than the U.S. average. During the 1970s, the service producing proportion of employment increased from 60.3 percent to 65.2 percent.

The Northern Industrial Tier had a parallel shift toward service producing industries during the 1970s; in fact, the Tier even began and ended the period with a larger percentage than the Sunbelt. Nevertheless, the Tier states also had a much higher than average proportion of employment in manufacturing in 1970 (31.0 percent as compared with 23.9 percent for the Sunbelt, 19.1 percent for the Remainder of the U.S.,

TABLE 3

EMPLOYMENT/POPULATION RATIOS
KENTUCKY, SUNBELT, NORTHERN INDUSTRIAL TIER AND
UNITED STATES, 1970, 1975, AND 1977

| Region | 1970 | 1975 | Percent Change 1970-75 | 1977 | Percent Change 1975-77 | Percent Change 1970-77 |
|---|---|---|---|---|---|---|
| Kentucky | .329 | .349 | 6.1 | .374 | 7.2 | 13.7 |
| Sunbelt | .347 | .365 | 5.2 | .382 | 4.7 | 10.1 |
| Tier | .384 | .385 | 0.3 | .401 | 4.2 | 4.4 |
| Rest of U.S. | .373 | .395 | 5.9 | .414 | 4.8 | 11.0 |
| United States | .370 | .382 | 3.2 | .399 | 4.5 | 7.8 |

SOURCE: Compiled from data in Tables 1 and 2a-e.

and 25.6 percent for the U.S. as a whole), and manufacturing was the slowest growing U.S. industry between 1970 and 1977. Thus, part of the reason for the Northern Industrial Tier's weak economic performance vis a vis the Sunbelt was an industrial structure heavily dominated by manufacturing. Of course it must be remembered that manufacturing employment supports employment in trade and service industries, to the extent that manufactured goods are exported from a state. Thus manufacturing employment is important to any state's industrial structure. It is still true, however, that manufacturing was the slowest growing U.S. industry in 1970-77, and this fact contributed to the slower total employment growth in the Tier. It should be noted, however, that manufacturing growth may improve in the future.

The structural problem of overly heavy reliance on manufacturing was intensified by a shift in manufacturing employment from the Northern Industrial Tier to the Sunbelt and to the Remainder of the U.S. Whether this shift was due primarily to expansion of firms already in the Sunbelt (or the creation of new firms there) coupled with contractions and shutdowns of northern firms, as Jusenius and Ledebur contend,[6] or whether firms actually moved, the result is clear from the data. Manufacturing employment declined in the Northern Industrial Tier; grew at 11 times the national rate in Kentucky and the Sunbelt; and increased at 9 times the national rate in the Remainder of the U.S. The Sunbelt's share of total U.S. manufacturing employment grew from 23.4 percent in 1970 to 26.0 percent in 1977.

A complete explanation of the economic decline in the Northern Industrial Tier and economic growth in other regions, though, must include consideration of amenities and lifestyles. The other regions generally have better climates, more recreational facilities, and more relaxed lifestyles than the Northern Industrial Tier.

It has also been argued that part of the blame for the relatively poor economic performance of the Northern Industrial Tier must be placed on state and local governments, which are considered by many to be too large and inclined to overregulate business. One measure of the size of government is its share of total employment. Interestingly, in both 1970 and 1977, a smaller percentage of Northern Industrial Tier employment was in state and local government than for any other region. Moreover, a smaller percentage of the Tier's population was employed in state and local government in both years.

If the Northern Industrial Tier has a lower dependency ratio, a smaller percentage of employment and population in state and local government, and a more service-oriented employment structure than the Sunbelt (although the Tier is less service-oriented than the Remainder of the U.S. region) why then is it growing so much more slowly? Part of the reason is structural, as was shown above: the Northern Industrial Tier relies too heavily on manufacturing, a very slow growing industry nationwide. In addition, part of the reason, as will be shown below, may be the greater tax burden imposed upon business and citizens.

## Comparative Public Sector Performance

The current movement to limit or reduce public sector taxing and spending is meeting with success in a number of states. The bases of the movement are the beliefs that the public sector's share of the total economic pie has increased beyond socially desirable levels, that too many of certain kinds of public goods (such as welfare) are being provided by government, and that the government is less efficient than the private sector in providing goods and services.

Has the public sector–specifically state and local governments–been increasing its share of total economic activity? Table 4a shows that total revenues of all U.S. state and local governments grew by 95.9 percent between fiscal 1969-70 and 1975-76; expenditures grew at a slightly lower rate, by 94.6 percent. Among the kinds of revenue, intergovernmental federal revenue[7] grew fastest, by 154.3 percent, followed by charges and miscellaneous revenue, which grew by 98.0 percent. Tax revenue grew relatively slowly, by only 80.7 percent, and property tax revenue grew by only 67.4 percent. The fastest growing expenditure categories were: interest on general debt (134.8 percent), which accelerated in 1975-76; all other (117.5 percent), which includes sewer and water systems, parks and recreation, general government, and miscellaneous; public welfare (114.1 percent); health and hospitals (114.0 percent); and police and fire (106.0 percent). State and local expenditures for education grew by 84.4 percent, which was less than the rate of growth of total expenditures but more than the growth of personal income (69.1 percent for the comparable period). Since total state and local expenditures, total taxes, and expenditures on education and other areas all exceeded personal income growth, it is clear that, for the U.S. as a whole, state and local governments increased their share of economic activity in the 1970s.

In Kentucky, state and local tax revenues grew by 95.4 percent between fiscal years 1969-70 and 1975-76 (Table 4b). Intergovernmental federal funds grew by 140.8 percent, which was below the national average; however, federal intergovernmental revenue in both 1969-70 and 1975-76 contributed a larger share to Kentucky's total revenue than for any of the other regions. Nevertheless, to the extent that federal funds ought to be inversely proportional to per capita income (and per capita income is an element in nearly all allocation formulae), Kentucky should receive an above average share since its per capita income is low. The

TABLE 4a

GENERAL REVENUE AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS: UNITED STATES TOTAL, 1969-70, 1974-75, AND 1975-76
(Millions of Dollars)

| Item | 1969-70 | Percent of Total | 1974-75 | Percent Change 1970-75 | 1975-76 | Percent of Total | Percent Change 1975-76 | Percent Change 1970-76 |
|---|---|---|---|---|---|---|---|---|
| Revenue: | | | | | | | | |
| Intergovernmental (Federal) | 21,857.5 | *16.7* | 47,053.8 | 115.3 | 55,589.3 | *21.7* | 18.1 | 154.3 |
| Total Tax Revenue | 86,795.3 | *66.4* | 141,465.0 | 63.0 | 156,812.9 | *61.2* | 10.8 | 80.7 |
| Property Tax Revenue | (34,054.5) | *(26.0)* | (51,490.9) | 51.2 | (57,001.5) | *(22.3)* | 10.7 | 67.4 |
| Charges and Misc. Revenue | 22,102.9 | *16.9* | 39,676.1 | 79.5 | 43,773.5 | *17.1* | 10.3 | 98.0 |
| Total General Revenue | 130,755.7 | *100.0* | 228,194.9 | 74.5 | 256,175.8 | *100.0* | 12.3 | 95.9 |
| Expenditures: | | | | | | | | |
| Education | 52,717.8 | *40.1* | 87,858.1 | 66.7 | 97,216.3 | *38.0* | 10.7 | 84.4 |
| Highways | 16,427.3 | *12.5* | 22,527.7 | 37.1 | 23,906.8 | *9.4* | 6.1 | 45.5 |
| Public Welfare | 14,679.3 | *11.2* | 27,191.0 | 85.2 | 31,434.8 | *12.3* | 15.6 | 114.1 |
| Health and Hospitals | 9,668.1 | *7.4* | 18,846.2 | 94.9 | 20,686.2 | *8.1* | 9.8 | 114.0 |
| Police and Fire | 6,517.9 | *5.0* | 11,841.8 | 81.7 | 13,428.2 | *5.3* | 13.4 | 106.0 |
| Interest on General Debt | 4,373.9 | *3.3* | 8,782.1 | 100.8 | 10,268.8 | *4.0* | 16.9 | 134.8 |
| All Other | 26,947.4 | *20.5* | 52,427.1 | 94.6 | 58,610.2 | *22.9* | 11.8 | 117.5 |
| Total General Expenditures | 131,331.7 | *100.0* | 229,474.0 | 74.7 | 255,551.3 | *100.0* | 11.4 | 94.6 |

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of the Census, U.S. Department of Commerce, *Governmental Finances in 1969-70, 1974-75, 1975-76*, Series GF 70, No. 5; GF 75, No. 5; and GF 76, No. 5; U.S. Government Printing Office, Washington, D.C.: 1971, 1976, and 1977.

fastest growing public expenditure categories in Kentucky over the period were police and fire (129.2 percent), public welfare (128.7 percent), and all other (127.8 percent).

In the Sunbelt, state and local revenues and expenditures outgrew the nation during the fiscal 1969-70 to fiscal 1975-76 period (Table 4c). Intergovermental transfers from the federal government grew faster than the U.S. average from 1969-70 to 1974-75, but slower between 1974-75 and 1975-76, and were slightly below the U.S. rate for the entire period. Still, transfers were 23.5 percent of Sunbelt state and local revenues compared with 21.7 percent for all states in 1975-76. Sunbelt tax revenues grew by 94.8 percent over the entire period, compared with personal income growth of 86.1 percent. Fastest growing expenditure categories in the Sunbelt were: all other (142.8 percent); health and hospitals (165.8 percent), police and fire (143.9 percent), and public welfare (103.7 percent). Note that interest on general debt did not grow rapidly in the Sunbelt, as it did for the all-state total. Public welfare expenditures also grew more slowly in the Sunbelt than in the nation, while expenditures on education grew faster.

State and local revenues and expenditures grew more slowly in the Northern Industrial Tier than in either the nation or the Sunbelt from 1969-70 to 1975-76, but grew relatively faster than personal income (Table 4d). Intergovernmental revenues from the federal government were the fastest growing component of revenues, but the percent of Tier revenues originating in transfers was still behind the averages for each of the other regions in 1975-76. Fastest growing expenditure categories were: interest on public debt (170.5 percent, which well exceeds the U.S. growth rate); public welfare (137.4 percent, also well above the U.S. growth rate); and health and hospitals (92.9 percent).

In the Remainder of the U.S., both revenues and expenditures grew at rates slightly below the U.S. average (Table 4e). Intergovernmental revenues grew more slowly than for the other regions and by 1975-76 represented an average share of total revenues. Fastest growing public expenditure categories were: all other (120.2 percent); police and fire (111.8 percent); health and hospitals (108.9 percent); and interest on general debt (101.3 percent).

The data in Tables 4a-4e clearly point out the public sector dilemma of the Northern Industrial Tier. The demands for public expenditures, particularly for welfare (which consumes 14.6 percent of state and local government revenues in the Tier, compared with 12.8 percent in Kentucky, 8.9 percent in the Sunbelt, and a U.S. average of 12.3 percent), have resulted in both relatively high taxes and relatively more borrowing (interest

TABLE 4b

GENERAL REVENUE AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS: KENTUCKY, 1969-70, 1974-75, AND 1975-76
(Millions of Dollars)

| Item | 1969-70 | Percent of Total | 1974-75 | Percent Change 1970-75 | 1975-76 | Percent of Total | Percent Change 1975-76 | Percent Change 1970-76 |
|---|---|---|---|---|---|---|---|---|
| Revenue: | | | | | | | | |
| Intergovernmental (Federal) | 372.9 | *22.8* | 778.6 | 108.8 | 898.0 | *26.7* | 15.3 | 140.8 |
| Total Tax Revenue | 962.7 | *58.9* | 1,680.0 | 75.3 | 1,880.8 | *55.9* | 11.4 | 95.4 |
| Property Tax Revenue | (220.8) | *(13.5)* | (322.2) | 45.9 | (359.0) | *(10.7)* | 11.4 | 62.6 |
| Charges and Misc. Revenue | 298.8 | *18.3* | 569.7 | 90.7 | 586.8 | *17.4* | 3.0 | 96.4 |
| Total General Revenue | 1,634.4 | *100.0* | 3,036.3 | 85.8 | 3,365.7 | *100.0* | 10.8 | 105.9 |
| Expenditures: | | | | | | | | |
| Education | 716.6 | *41.7* | 1,133.2 | 58.1 | 1,267.8 | *39.5* | 11.9 | 76.9 |
| Highways | 307.3 | *17.9* | 410.5 | 33.5 | 458.8 | *14.3* | 11.8 | 49.3 |
| Public Welfare | 180.2 | *10.5* | 331.7 | 84.1 | 412.1 | *12.8* | 24.2 | 128.7 |
| Health and Hospitals | 103.3 | *6.0* | 175.1 | 69.5 | 184.6 | *5.7* | 5.4 | 78.7 |
| Police and Fire | 60.3 | *3.5* | 128.6 | 113.3 | 138.2 | *4.3* | 7.5 | 129.2 |
| Interest on General Debt | 85.9 | *5.0* | 139.5 | 62.4 | 146.0 | *4.5* | 4.7 | 70.0 |
| All Other | 265.8 | *15.5* | 525.9 | 97.9 | 605.5 | *18.8* | 15.1 | 127.8 |
| Total General Expenditures | 1,719.4 | *100.1* | 2,844.5 | 65.4 | 3,213.0 | *99.9* | 13.0 | 86.9 |

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of the Census, U.S. Department of Commerce, *Governmental Finances in 1969-70, 1974-75, 1975-76*, Series GF 70, No. 5; GF 75, No. 5; and GF 76, No. 5; U.S. Government Printing Office, Washington, D.C.: 1971, 1976, and 1977.

TABLE 4c

GENERAL REVENUE AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS: SUNBELT, 1969-70, 1974-75, AND 1975-76
(Millions of Dollars)

| Item | 1969-70 | Percent of Total | 1974-75 | Percent Change 1970-75 | 1975-76 | Percent of Total | Percent Change 1975-76 | Percent Change 1970-76 |
|---|---|---|---|---|---|---|---|---|
| Revenue: | | | | | | | | |
| Intergovernmental (Federal) | 5,421.9 | *19.6* | 12,107.8 | 123.3 | 13,737.9 | *23.5* | 13.5 | 153.4 |
| Total Tax Revenue | 16,840.2 | *60.8* | 29,566.2 | 75.6 | 32,811.5 | *56.1* | 11.0 | 94.8 |
| Property Tax Revenue | (4,997.5) | *(18.0)* | (8,128.9) | 62.7 | (9,177.7) | *(15.7)* | 12.9 | 83.6 |
| Charges and Misc. Revenue | 5,452.3 | *19.7* | 10,363.9 | 90.1 | 11,940.6 | *20.4* | 15.2 | 119.0 |
| Total General Revenue | 27,714.4 | *100.1* | 52,037.9 | 87.8 | 58,490.3 | *100.0* | 12.4 | 111.0 |
| Expenditures: | | | | | | | | |
| Education | 11,770.4 | *42.1* | 20,801.9 | 76.7 | 23,385.6 | *40.0* | 12.4 | 98.7 |
| Highways | 4,170.1 | *14.9* | 6,613.0 | 58.6 | 6,798.4 | *11.6* | 2.8 | 63.0 |
| Public Welfare | 2,549.3 | *9.1* | 4,545.1 | 78.3 | 5,192.6 | *8.9* | 14.2 | 103.7 |
| Health and Hospitals | 2,195.4 | *7.9* | 4,988.3 | 127.2 | 5,836.1 | *10.0* | 17.0 | 165.8 |
| Police and Fire | 1,151.1 | *4.1* | 2,434.4 | 111.5 | 2,807.0 | *4.8* | 15.3 | 143.9 |
| Interest on General Debt | 974.6 | *3.5* | 1,747.3 | 79.3 | 1,951.2 | *3.3* | 11.7 | 100.2 |
| All Other | 5,148.2 | *18.4* | 11,002.5 | 113.7 | 12,501.3 | *21.4* | 13.6 | 142.8 |
| Total General Expenditures | 27,959.0 | *100.0* | 52,132.8 | 86.5 | 58,472.3 | *100.0* | 12.2 | 109.1 |

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of the Census, U.S. Department of Commerce, *Governmental Finances in 1969-70, 1974-75, 1975-76*, Series GF 70, No. 5; GF 75, No. 5; and GF 76, No. 5; U.S. Government Printing Office, Washington, D.C.: 1971, 1976, and 1977.

TABLE 4d

GENERAL REVENUE AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS: NORTHERN INDUSTRIAL TIER, 1969-70, 1974-75, AND 1975-76
(Millions of Dollars)

| Item | 1969-70 | Percent of Total | 1974-75 | Percent Change 1970-75 | 1975-76 | Percent of Total | Percent Change 1975-76 | Percent Change 1970-76 |
|---|---|---|---|---|---|---|---|---|
| Revenue: | | | | | | | | |
| Intergovernmental (Federal) | 8,072.3 | *13.9* | 18,623.7 | 130.7 | 22,617.0 | *20.4* | 21.4 | 180.2 |
| Total Tax Revenue | 41,735.7 | *71.9* | 65,424.4 | 56.8 | 71,352.6 | *64.4* | 9.1 | 71.0 |
| Property Tax Revenue | (17,195.2) | *(29.6)* | (25,934.5) | 50.8 | (27,787.6) | *(25.1)* | 7.1 | 61.6 |
| Charges and Misc. Revenue | 8,269.7 | *14.2* | 15,808.7 | 91.2 | 16,875.1 | *15.2* | 6.7 | 104.1 |
| Total General Revenue | 58,077.7 | *100.0* | 99,856.8 | 71.9 | 110,845.7 | *100.0* | 11.0 | 90.9 |
| Expenditures: | | | | | | | | |
| Education | 23,222.3 | *39.4* | 37,855.7 | 63.0 | 40,652.9 | *36.3* | 7.4 | 75.1 |
| Highways | 6,444.3 | *10.9* | 8,281.6 | 28.5 | 8,804.1 | *7.9* | 6.3 | 36.6 |
| Public Welfare | 6,863.2 | *11.7* | 14,042.3 | 104.6 | 16,293.5 | *14.6* | 16.0 | 137.4 |
| Health and Hospitals | 4,576.6 | *7.8* | 8,521.3 | 86.2 | 8,830.2 | *7.9* | 3.6 | 92.9 |
| Police and Fire | 3,271.2 | *5.6* | 5,449.0 | 66.6 | 6,172.6 | *5.5* | 13.3 | 88.7 |
| Interest on General Debt | 2,170.5 | *3.7* | 4,873.5 | 124.5 | 5,871.2 | *5.2* | 20.5 | 170.5 |
| All Other | 12,325.2 | *20.9* | 23,146.6 | 87.8 | 25,227.3 | *22.6* | 9.0 | 104.7 |
| Total General Expenditures | 58,873.2 | *100.0* | 102,170.8 | 73.5 | 111,851.8 | *100.0* | 9.5 | 90.0 |

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of the Census, U.S. Department of Commerce, *Governmental Finances in 1969-70, 1974-75, 1975-76*, Series GF 70, No. 5; GF 75, No. 5; and GF 76, No. 5; U.S. Government Printing Office, Washington, D.C.: 1971, 1976, and 1977.

TABLE 4e

GENERAL REVENUE AND EXPENDITURES OF STATE AND LOCAL GOVERNMENTS: REST OF THE UNITED STATES, 1969-70, 1974-75, AND 1975-76
(Millons of Dollars)

| Item | 1969-70 | Percent of Total | 1974-75 | Percent Change 1970-75 | 1975-76 | Percent of Total | Percent Change 1975-76 | Percent Change 1970-76 |
|---|---|---|---|---|---|---|---|---|
| Revenue: | | | | | | | | |
| Intergovernmental (Federal) | 7,990.4 | *18.4* | 15,543.7 | 94.5 | 18,336.4 | *22.0* | 18.0 | 129.5 |
| Total Tax Revenue | 27,256.7 | *62.9* | 44,786.4 | 64.3 | 50,768.0 | *60.8* | 13.4 | 86.3 |
| Property Tax Revenue | (11,641.0) | *(26.9)* | (17,105.3) | 46.9 | (19,677.2) | *(23.6)* | 15.0 | 69.0 |
| Charges and Misc. Revenue | 8,082.1 | *18.7* | 12,933.8 | 60.0 | 14,371.0 | *17.2* | 11.1 | 77.8 |
| Total General Revenue | 43,329.2 | *100.0* | 73,263.9 | 69.1 | 83,474.1 | *100.0* | 13.9 | 92.7 |
| Expenditures: | | | | | | | | |
| Education | 17,008.5 | *39.8* | 28,067.3 | 65.0 | 31,910.0 | *38.9* | 13.7 | 87.6 |
| Highways | 5,505.6 | *12.9* | 7,222.6 | 31.2 | 7,845.5 | *9.6* | 8.6 | 42.5 |
| Public Welfare | 5,086.6 | *11.9* | 8,271.9 | 62.6 | 9,536.6 | *11.6* | 15.3 | 87.5 |
| Health and Hospitals | 2,792.8 | *6.5* | 5,161.5 | 84.8 | 5,835.3 | *7.1* | 13.1 | 108.9 |
| Police and Fire | 2,035.3 | *4.8* | 3,829.8 | 88.2 | 4,310.4 | *5.3* | 12.5 | 111.8 |
| Interest on General Debt | 1,142.9 | *2.7* | 2,021.8 | 76.9 | 2,300.4 | *2.8* | 13.8 | 101.3 |
| All Other | 9,208.2 | *21.5* | 17,752.1 | 92.8 | 20,276.1 | *24.7* | 14.2 | 120.2 |
| Total General Expenditures | 42,780.1 | *100.1* | 72,325.9 | 69.1 | 82,014.2 | *100.0* | 13.4 | 91.7 |

Note: Columns may not add to totals due to rounding.

SOURCE: Bureau of the Census, U.S. Department of Commerce, *Governmental Finances in 1969-70, 1974-75, 1975-76*, Series GF 70, No. 5; GF 75, No. 5; and GF 76, No. 5; U.S. Government Printing Office, Washington, D.C.: 1971, 1976, and 1977.

comprises 5.2 percent of Tier expenditures, compared with 4.5 percent in Kentucky, 3.3 percent in the Sunbelt, and a U.S. average of 4.0 percent).

## Tax Effort

The best broad measure of tax effort is personal income, since personal income is a good basic measure of the ability to pay. Figure 4 compares the growth in tax revenues with the growth in personal income for each region for the period 1969-70 to 1975-76. In every region, tax revenue growth exceeded income growth. The ratio of tax revenue growth to income growth—a measure of the rate at which the public sector gained—was greatest in the Northern Industrial Tier, followed by Kentucky.

Table 5 examines revenue per capita and per dollar of personal income in the five regions. On a per capita basis, intergovernmental revenues are highest in the Remainder of the U.S., followed by Kentucky; tax revenues are highest in the Remainder of the U.S., followed closely by the Northern Industrial Tier. Growth in per capita intergovernmental revenues between 1969-70 and 1975-76 was greatest in the Tier, smallest in the Remainder of the U.S.; tax revenue growth was greatest in Kentucky, smallest in the Northern Industrial Tier. Per capita data are of limited usefulness however, because they do not relate to the ability to pay.

Turning now to revenue per dollar of personal income data, also shown in Table 5, it can be seen that the overall variation in tax effort among the regions ranges from a low of 10.7 cents per dollar of personal income in the Sunbelt to a high of 13.4 cents per dollar in the Remainder of the U.S. Kentucky's effort is relatively low, but grew rapidly during the 1969-70 to 1975-76 period. Tax effort in the Northern Industrial Tier is relatively high, and grew faster than in any other region over the period.

In terms of tax effort, then, state and local governments in all regions took a larger share of personal income in taxes in 1975-76 compared with 1969-70—which may provide some basis for a taxpayers' revolt. However, it should be remembered that part of this increasing share is due to the effects of inflation on existing tax structures, and is not a result of increases in tax rates or enlargements of tax bases. A graduated income tax, for example, will yield a larger percentage of each addition to income. In relative terms, Kentucky and the Sunbelt take smaller percentages of personal income in taxes than the Tier or the Remainder of the U.S., and thus the pressure for a tax revolt ought to be less intense.[8]

FIGURE 4

PERCENT CHANGE IN PERSONAL INCOME, 1969 TO 1975; AND PERCENT CHANGE IN STATE AND LOCAL GOVERNMENT TAX REVENUE, FISCAL 1969-70 TO 1975-76

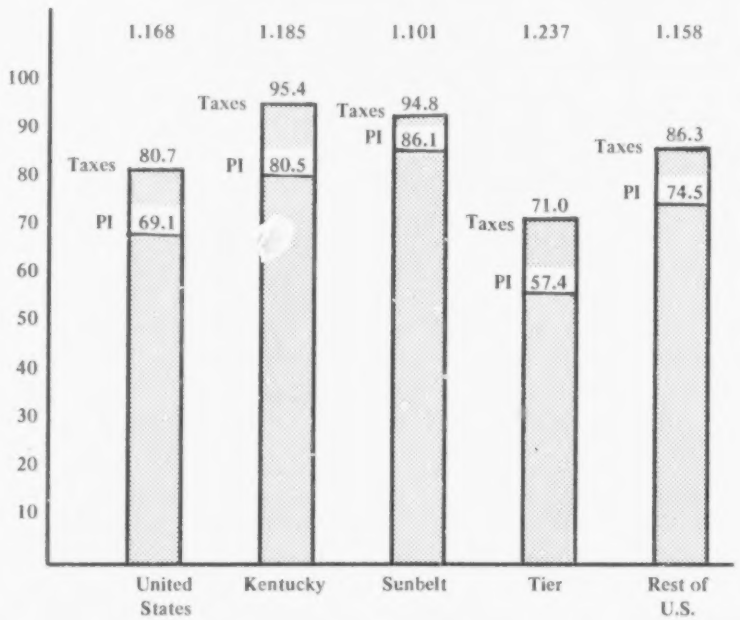


TABLE 5

STATE AND LOCAL GOVERNMENT REVENUES PER CAPITA AND PER DOLLAR OF PERSONAL INCOME: KENTUCKY, SUNBELT, NORTHERN INDUSTRIAL TIER AND UNITED STATES; FISCAL YEARS 1969-70 AND 1975-76

| | Per Capita | | | Per $1 of Personal Income | | |
|---|---|---|---|---|---|---|
| Region and Type of Revenue | 1969-70 | 1975-76 | Percent Change | 1969-70 | 1975-76 | Percent Change |
| Kentucky: | | | | | | |
| Intergovernmental | $116.60 | $ 265.13 | 127.4 | .041 | .054 | 31.7 |
| Total Tax Revenue | 301.03 | 555.30 | 84.5 | .105 | .114 | 8.6 |
| Total General Revenue | 511.07 | 993.71 | 94.4 | .178 | .203 | 14.0 |
| Sunbelt: | | | | | | |
| Intergovernmental | $100.74 | $ 231.90 | 130.2 | .033 | .045 | 36.4 |
| Total Tax Revenue | 312.89 | 553.86 | 77.0 | .102 | .107 | 4.9 |
| Total General Revenue | 514.93 | 987.33 | 91.7 | .169 | .191 | 13.0 |
| Northern Industrial Tier: | | | | | | |
| Intergovernmental | $ 93.40 | $ 256.84 | 175.0 | .023 | .041 | 78.3 |
| Total Tax Revenue | 482.90 | 810.27 | 67.8 | .120 | .131 | 9.1 |
| Total General Revenue | 671.99 | 1,258.75 | 87.3 | .167 | .203 | 21.6 |
| Rest of U.S.: | | | | | | |
| Intergovernmental | $138.12 | $ 294.17 | 113.0 | .036 | .048 | 33.3 |
| Total Tax Revenue | 471.15 | 814.48 | 72.9 | .125 | .134 | 7.2 |
| Total General Revenue | 748.98 | 1,339.19 | 78.8 | .199 | .220 | 10.6 |
| United States: | | | | | | |
| Intergovernmental | $108.58 | $ 260.96 | 140.3 | .030 | .045 | 50.0 |
| Total Tax Revenue | 431.18 | 736.14 | 70.7 | .118 | .126 | 6.8 |
| Total General Revenue | 649.56 | 1,202.59 | 85.1 | .177 | .205 | 15.8 |

SOURCE: Table 4a-e and Bureau of Economic Analysis, unpublished data, August 1978.

## Expenditure Effort

Three categories of expenditures receive a great deal of public attention: education, welfare, and interest (which is related to the magnitude of state and local debt). Table 6 presents expenditure per capita and per dollar of personal income data for these three categories.

Kentucky's per capita expenditures on education have been the lowest of the study regions, and grew the slowest between 1969-70 and 1975-76. On a per dollar of personal income basis, however, they exceed the averages for the Sunbelt and the Northern Industrial Tier, and are only slightly below the U.S. average. Thus Kentucky's educational effort must be considered adequate, at least in relation to personal income. It should be noted, however, that part of Kentucky's educational effort may be due to an age structure more heavily dominated by school-age children (which was indicated earlier in the data showing lower labor force participation in Kentucky). Since the data in Table 6 are very broad and do not even distinguish between primary and secondary education and higher education, a complete assessment of Kentucky's educational effort cannot be made on the basis of the data presented here.

Per capita expenditures on public welfare are, as expected, highest in the Northern Industrial Tier, but Kentucky is not far behind. On a per dollar of personal income basis, however, Kentucky spends only an average amount on welfare. Only the Northern Industrial Tier exceeds the U.S. average–by about 20 percent.

In per capita terms, Kentucky spends more on interest than any region except the Northern Industrial Tier, but remains below the U.S. average. As a percentage of personal income, Kentucky again spends more than any region except the Tier, but is slightly above the U.S. average.

## Conclusions

The data presented in this study show that on the dimensions of economic and public sector performance, Kentucky can be classified as a member of the Sunbelt. As with the rest of the Sunbelt, Kentucky's per capita income is low, but its economic growth–measured by population, income, or employment–has been outstanding in the 1970s. Also like the Sunbelt, Kentucky's

TABLE 6

SELECTED STATE AND LOCAL GOVERNMENT EXPENDITURES PER CAPITA AND PER DOLLAR OF PERSONAL INCOME; KENTUCKY, SUNBELT, NORTHERN INDUSTRIAL TIER AND UNITED STATES; FISCAL YEARS 1969-70 AND 1975-76

| | Per Capita | | | Per $1 of Personal Income | | |
|---|---|---|---|---|---|---|
| Region and Type of Expenditure | 1969-70 | 1975-76 | Percent Change | 1969-70 | 1975-76 | Percent Change |
| Kentucky: | | | | | | |
| Education | $224.08 | $374.31 | 67.0 | .078 | .077 | -1.3 |
| Public Welfare | 56.35 | 121.67 | 115.9 | .020 | .025 | 25.0 |
| Interest on General Debt | 26.86 | 43.11 | 60.5 | .009 | .009 | 0.0 |
| Sunbelt: | | | | | | |
| Education | $218.69 | $394.75 | 80.5 | .072 | .076 | 5.5 |
| Public Welfare | 47.37 | 87.65 | 85.0 | .016 | .017 | 6.3 |
| Interest on General Debt | 18.11 | 32.94 | 81.9 | .006 | .006 | 0.0 |
| Northern Industrial Tier: | | | | | | |
| Education | $268.69 | $461.64 | 71.8 | .067 | .074 | 10.4 |
| Public Welfare | 79.41 | 185.03 | 133.0 | .020 | .030 | 50.0 |
| Interest on General Debt | 25.11 | 66.67 | 165.5 | .006 | .011 | 83.3 |
| Rest of U.S.: | | | | | | |
| Education | $294.01 | $511.94 | 74.1 | .078 | .084 | 7.7 |
| Public Welfare | 87.93 | 153.00 | 74.0 | .023 | .025 | 8.7 |
| Interest on General Debt | 19.76 | 36.91 | 86.8 | .005 | .006 | 20.0 |
| United States: | | | | | | |
| Education | $249.50 | $456.37 | 82.9 | .071 | .078 | 9.9 |
| Public Welfare | 69.47 | 147.57 | 112.4 | .020 | .025 | 25.0 |
| Interest on General Debt | 20.70 | 48.21 | 132.9 | .006 | .008 | 33.3 |

SOURCE: Table 4a-e and Bureau of Economic Analysis, unpublished data, August 1978.

tax effort is low, although it has grown more rapidly than for other Sunbelt states in recent years. (Preliminary data for fiscal 1976-77 show a slight decline in Kentucky's overall tax effort, no change in the Sunbelt, and increases in the Northern Industrial Tier and the Remainder of the U.S.[9]

The relatively low tax effort in Kentucky and the other Sunbelt states argues against tax revolt. However, one Sunbelt state, Tennessee, has already acted to limit the rate of growth of state government expenditures to the rate of growth of personal income—although the restriction can be overridden by a simple majority of the legislature. Thus, despite their relatively favorable tax levels, some citizens in the Sunbelt are showing signs of dissatisfaction with their public sector.

On the issue of public debt, this study showed only that Kentucky pays a relatively high proportion of its personal income for interest. Part of the reason for Kentucky's relatively high debt, however, may be its relatively underdeveloped economy. Economies, like families, often borrow more during their developmental stages than after they have matured, in order to provide the infrastructure (roads, educational facilities, and other governmental capital) necessary to support economic growth. A more detailed study of Kentucky's debt has been prepared by Gift.[10]

Kentucky's economy has performed well in the 1970s, and per capita income in the state is growing closer to the national average. Moreover, although Kentucky has a relatively low tax effort, it is still able to support such important public sector activities as education and public welfare adequately in relation to personal income.

Footnotes

[1]C. L. Jusenius and L. C. Ledebur, "A Myth in the Making: The Southern Economic Challenge and Northern Economic Decline," in *The Economics of Southern Growth*, E. Blaine Liner and Lawrence K. Lynch, eds. (Durham, North Carolina: Fisher-Harrison), 1977.

[2]Bureau of Labor Statistics, U.S. Department of Labor, *Monthly Labor Review*, Vol. 101, No. 5 (May 1978).

[3]Only the following ten invididual states grew faster than Kentucky: Alabama, Alaska, Arkansas, Louisiana, Mississippi, North Dakota, Texas, Washington, D.C., West Virginia, and Wyoming.

[4]Bureau of Labor Statistics, U.S. Department of Labor,

*Monthly Labor Review*, Vol. 101, No. 5 (May 1978).

[5]William H. Miernyk, "The Changing Structure of the Southern Economy," in *The Economics of Southern Growth*, E. Blaine Liner and Lawrence K. Lynch, eds. (Durham, North Carolina: Fisher-Harrison), 1977.

[6]C. L. Jusenius and L. C. Ledebur, "A Myth in the Making: The Southern Economic Challenge and Northern Economic Decline," in *The Economics of Southern Growth*, E. Blaine Liner and Lawrence K. Lynch, eds. (Durham, North Carolina: Fisher-Harrison), 1977, p. 161.

[7]Intergovernmental revenue includes grants-in-aid, shared taxes (i.e., revenue sharing), payments for services performed on a reimbursement or cost-sharing basis, and revenue received in lieu of taxes.

[8]It is important to distinguish between tax *effort* and tax *burden*. Tax effort is commonly measured by dividing total tax collections by total population or total personal income. Tax burden, on the other hand, may be measured by counting only those taxes directly paid by individuals or families (personal income taxes, residential property taxes, sales and excise taxes), and ignoring taxes on business which are thought to be partially "exported" from a state. As Lile shows in the following article, Kentucky has a relatively high family tax burden, although its total tax effort is comparatively low. This simply means that personal taxes are relatively high in Kentucky, while business taxes are very low compared to other states.

[9]Bureau of the Census, U.S. Department of Commerce, *Preliminary Report, Governmental Finances in 1976-77*, GF 77, No. 5P, September 1978.

[10]Richard E. Gift, "The Kentucky State Debt," *Kentucky Council of Economic Advisors Policy Paper Series No. 7* (Lexington, Kentucky: Council of Economic Advisors, Office for Research, University of Kentucky, September 1978).

# IV. Kentucky Taxes: How Do They Compare?

by Stephen E. Lile*

Taxation typically generates much interest in Kentucky, but the level of interest is unusually high in early 1979, due to Proposition 13 and the attention given to tax limits enacted by several states in recent months. It is very appropriate, therefore, to ask how Kentucky taxes compare with those levied in other states, both in terms of level of burden and distribution of burden among income classes.

The most frequently used method for comparing tax burdens among states involves summing up all taxes collected (e.g., sales, income, property, business license, corporate income, mineral severance, etc.) and dividing by either state population or personal income. The result, respectively, is "taxes per capita" and "taxes as a percent of income." Both measures are easily computed, which explains their widespread use; however, they have serious shortcomings when used to measure and compare resident tax burdens among states.[1]

First, neither measure provides any indication of how the tax burden is distributed among income classes. States X and Y with equal taxes per capita are viewed as placing an equal tax burden on their residents even though the distribution of burden might be highly regressive in State X but proportional or progressive in State Y.[2] While tax equity defies objective definition and people disagree about the weight that it should be given among the many criteria of a good tax system, few persons would favor ignoring equity. Second, taxpayers have difficulty relating their particular income and family size circumstances to either of the conventional measures of tax burden. The third and perhaps greatest shortcoming involves the treatment of business taxes. The conventional measures lump business taxes with direct taxes levied on persons and implicitly assume that the entire burden of taxes collected by State X is on residents of State X. This is highly unlikely because of tax exporting. In reality, business taxes collected by State X may be shifted to residents of States Y and Z in the form of higher prices for goods sold or (assuming no tax shifting) in the form of reduced profits to owners of businesses operating in States Y and Z. Under either assumption, a major portion of business taxes collected by a given state is likely to become a burden on residents of other states.[3]

An alternative method for comparing tax burdens involves estimating the major state and local taxes that hypothetical families of given income, consumption, and family size characteristics would pay in different cities and states. Business taxes are omitted because of the uncertainty of their incidence and the resulting difficulty of allocating them correctly among families, and because the burden of business taxes is likely to be diffused fairly equally among families of given income size, income source, and consumption level, regardless of where they live.[4]

This article reports some of the findings of a recent study based on the hypothetical approach.[5] Family tax burden estimates include the following tax types: state income, local income, state sales, local sales, property taxes on homes, motor vehicle taxes, and cigarette excises. It is assumed that each hypothetical family of four owns a home and lives in the *largest city* of each state.[6]

## Findings

Estimates for Kentucky and forty-seven other states are first presented in terms of dollar amounts. Additional comparisons are made by expressing dollar estimates as a percent of the forty-eight state average. Next, state rankings on the basis of taxes per capita are compared with rankings based on family tax burdens. This comparison shows that Kentucky is much higher in family tax burden than in taxes per capita whereas the reverse is true for states such as Nevada and Louisiana, which have an above average capacity to export business taxes. Finally, Kentucky is compared with other states by degree of tax regression.

### Dollar Tax Burdens

*Family A: $7,500 AGI (Adjusted Gross Income).* Under the assumption that each hypothetical family lives in the largest city of each state, Table 1 shows that the five highest tax locations for Family A with a near

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*The author is Professor of Economics, Bowling Green College of Business and Public Affairs, Western Kentucky University. *The research for this paper was funded by the Kentucky Department of Revenue, which has published a more complete report of the findings (see Footnote 5).*

## TABLE 1

### FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
### FAMILY A: $7,500 ADJUSTED GROSS INCOME
### (Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $ 82 | $100 | $131 | $ 65 | $111 | $141 | $64[4] | $ 694 | 29 |
| Arizona | 90 | - | 150 | 38 | 296 | 172 | 52 | 798 | 17 |
| Arkansas | 84 | - | 108 | - | 211 | 159 | 71 | 633 | 32 |
| California | 4 | - | 134 | * | 460 | 153 | 40 | 791 | 18 |
| Colorado | 56 | - | 109 | 109 | 269 | 135 | 40 | 718 | 22 |
| Connecticut | - | - | 127 | - | 626 | 300 | 84 | 1,137 | 2 |
| Delaware | 134 | 94 | - | - | 360 | 113 | 56 | 757 | 21 |
| Florida | - | - | 90 | - | 205 | 118 | 68 | 481 | 44 |
| Georgia | 26 | - | 116 | 39 | 310 | 174 | 48 | 713 | 24 |
| Idaho | -3[5] | - | 105 | - | 308 | 122 | 36 | 568 | 38 |
| Illinois | 88 | - | 171 | * | 336 | 139 | 68[4] | 802 | 16 |
| Indiana | 100 | - | 104 | - | 425 | 209 | 24 | 862 | 13 |
| Iowa | 168 | - | 81 | - | 433 | 133 | 52 | 867 | 10 |
| Kansas | 48 | - | 122 | - | 314 | 168 | 44 | 696 | 28 |
| KENTUCKY | 142 | 165[6] | 124 | - | 265 | 155 | 12 | 863 | 12 |
| Louisiana | 0 | - | 71 | 71[7] | 93 | 101 | 44 | 380 | 48 |
| Maine | 14 | - | 118 | - | 518 | 169 | 64 | 883 | 9 |
| Maryland | 128 | 64 | 93 | - | 514 | 123 | 40 | 962 | 7 |
| Massachusetts | 143 | - | 42 | - | 771 | 273 | 84 | 1,313 | 1 |
| Michigan | 69 | 101 | 96 | - | 438[8] | 116 | 44 | 864 | 11 |
| Minnesota | 120 | - | 68 | - | 78[8] | 137 | 72 | 475 | 45 |
| Mississippi | - | - | 198 | - | 253 | 213 | 44 | 708 | 25 |
| Missouri | 18 | 75 | 112 | 37 | 332 | 183 | 64[4] | 821 | 15 |
| Montana | 151 | - | - | - | 271 | 159 | 48 | 629 | 33 |
| Nebraska | -47[5] | - | 99 | 40 | 421 | 201 | 52 | 766 | 20 |
| Nevada | - | - | 116 | * | 265 | 124 | 40 | 545 | 40 |
| New Hampshire | - | - | - | - | 630 | 168 | 48 | 846 | 14 |
| New Jersey | 70 | - | 74 | - | 763 | 128 | 76 | 1,111 | 4 |
| New Mexico | -127[5] | - | 170 | - | 269 | 97 | 48 | 457 | 46 |
| New York | 97 | 45 | 111 | 111[9] | 387 | 133 | 92[4] | 976 | 6 |
| North Carolina | 132 | - | 131 | * | 279 | 168 | 8 | 718 | 22 |
| North Dakota | 32 | - | 92 | - | 306 | 123 | 44 | 597 | 35 |
| Ohio | 25 | 75 | 78 | 19[10] | 362 | 86 | 60 | 705 | 26 |
| Oklahoma | 23 | - | 70 | 53 | 215 | 128 | 52 | 541 | 42 |
| Oregon | 176 | - | - | - | 109 | 92 | 36 | 413 | 47 |
| Pennsylvania | 150 | 276 | 66 | - | 427 | 117 | 72 | 1,108 | 5 |
| Rhode Island | 0 | - | 120 | - | 628 | 301 | 72 | 1,121 | 3 |
| South Carolina | 87 | - | 144 | - | 233 | 184 | 24 | 672 | 31 |
| South Dakota | - | - | 157 | 39 | 413 | 123 | 48 | 780 | 19 |
| Tennessee | - | - | 147[11] | 51 | 221 | 109 | 56[4] | 584 | 36 |
| Texas | - | - | 89 | 22 | 211 | 146 | 74 | 542 | 41 |
| Utah | 107 | - | 182 | * | 184 | 168 | 32 | 673 | 30 |
| Vermont | 11 | - | 54 | - | 338[8] | 125 | 48 | 576 | 37 |
| Virginia | 84 | - | 125 | * | 209 | 230 | 50[4] | 698 | 27 |
| Washington | - | - | 183 | * | 178 | 184 | 64 | 609 | 34 |
| West Virginia | 93 | - | 105 | - | 79 | 165 | 48 | 490 | 43 |
| Wisconsin | 135 | - | 106 | - | 552[8] | 90 | 64 | 947 | 8 |
| Wyoming | - | - | 116 | - | 243 | 164 | 32 | 555 | 39 |

*Local sales tax included in state estimate.

TABLE 1 (continued)

[1]The largest cities follow in the order of the states listed: Birmingham, Phoenix, Little Rock, Los Angeles, Denver, Hartford, Wilmington, Jacksonville, Atlanta, Boise, Chicago, Indianapolis, Des Moines, Wichita, Louisville, New Orleans, Portland, Baltimore, Boston, Detroit, Minneapolis, Biloxi, St. Louis, Billings, Omaha, Las Vegas, Manchester, Newark, Albuquerque, New York, Charlotte, Fargo, Cleveland, Oklahoma City, Portland, Philadelphia, Providence, Columbia, Sioux Falls, Memphis, Houston, Salt Lake City, Burlington, Norfolk, Seattle, Huntington, Milwaukee, Cheyenne. In the case of Mississippi, tax burdens are based on Biloxi because reliable property tax data comparable to that used for other states was not available for Jackson.
[2]Includes state gasoline tax, registration fees, personal property tax, and any other tax levied in lieu of a property tax.
[3]States are ranked from high to low, with the highest tax state assigned the number 1 and the lowest tax state the number 48.
[4]Estimate includes local cigarette excise.
[5]Negative figures reflect excess of credits for sales tax on food or utilities over state income tax liability.
[6]Includes one and one-fourth percent levied by the city of Louisville, three-fourths percent levied for schools, and two-tenths percent transit authority tax.
[7]Includes both the 2 percent New Orleans sales tax and the 1 percent tax levied for New Orleans Parish School Board.
[8]Reflects adjustment for property tax "circuit-breaker."
[9]Includes an adjustment for personal services taxed after February 29, 1976.
[10]Includes the 1 percent regional transit tax levied in Cuyahoga County.
[11]Adjusted for increase from 3½ to 4½ percent in state tax rate effective April 1, 1976.

SOURCE: Author's computations.

poverty income level are Boston, Hartford, Providence, Newark, and Philadelphia. The five lowest tax locations are New Orleans, Portland, Albuquerque, Minneapolis, and Jacksonville. Property tax "circuit-breakers"[7] in Oregon and Minnesota reduce Family A's property tax burden by $365 and $335, respectively, and are primarily responsible for these states being in the low tax group. Louisville's tax burden of $863 is 12th from the highest for the forty-eight locations studied.

*Family B: $10,000 AGI.* The five heaviest tax locations for a family with an income of $10,000 are shown in Table 2 as Boston, Milwaukee, Philadelphia, Providence, and Newark. Tax burdens are lowest in New Orleans, Jacksonville, Albuquerque, Huntington, and Houston. In Louisville, Family B pays major state and local taxes amounting to approximately $1,100, which ranks Louisville 10th highest.

*Family C: $15,000 AGI.* The tax burden on Family C with an income approximating the median family income for 1976 ranges from about $650 in Jacksonville to over $2,100 in Boston. As shown in Table 3, the five highest tax locations studied are Boston, Milwaukee, Philadelphia, Providence, and Newark. The five lowest are Jacksonville, New Orleans, Huntington, Houston, and Las Vegas. The family tax burden in Louisville at this income level is about $1,400, which ranks Louisville 11th from the highest among the city locations studied. The combined local occupational license tax paid by Family C in Louisville is exceeded only by the amount of local income tax levied in Philadelphia.

*Family D: $17,500 AGI.* Louisville's ranking in tax burden remains 11th from the highest for a hypothetical family of $17,500 income. Table 4 shows that the five highest tax locations are Boston, Milwaukee, Philadelphia, New York City, and Providence. The five lowest tax cities are Jacksonville, New Orleans, Houston, Huntington, and Cheyenne.

*Family E: $25,000 AGI.* The tax burden for a hypothetical family of $25,000 income ranges from a low of $841 in Jacksonville to a high of $3,289 in Milwaukee. Table 5 shows that the five highest tax cities studied are Milwaukee, Boston, New York City, Philadelphia, and Baltimore. The low tax group includes Jacksonville, New Orleans, Houston, Cheyenne, and Las Vegas, Louisville ranks 12th in family tax burden at this income level.

*Family F: $50,000 AGI.* The tax burden for this hypothetical family ranges from just over $1,200 in Jacksonville to nearly $7,900 in New York City. The $4,250 figure estimated for Louisville ranks 16th from the highest. The five lowest tax cities studied are Jacksonville, Houston, Cheyenne, Seattle, and Las Vegas. The fact that families living in these cities pay no state income tax explains much of their low tax-burden rankings. In contrast, the five highest tax locations—New York City, Milwaukee, Minneapolis, Boston, and Wilmington—are located in states with relatively progressive state income taxes.[8] The slight decline in Louisville's ranking (from 12th to 16th) is partly due to the deductibility of federal income tax liability against taxable income under Kentucky's income tax. This deductibility feature is not available to taxpayers in many states and it significantly reduces the state income tax liability for Kentucky taxpayers with high incomes.

TABLE 2

FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
FAMILY B: $10,000 ADJUSTED GROSS INCOME
(Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $163 | $100 | $157 | $ 78 | $132 | $141 | $64[4] | $ 835 | 29 |
| Arizona | 161 | - | 175 | 44 | 350 | 172 | 52 | 954 | 18 |
| Arkansas | 163 | - | 129 | - | 250 | 159 | 71 | 772 | 35 |
| California | 0 | - | 165 | * | 545 | 153 | 40 | 903 | 22 |
| Colorado | 138 | - | 128 | 128 | 319 | 135 | 40 | 888 | 24 |
| Connecticut | - | - | 160 | - | 742 | 300 | 84 | 1,286 | 6 |
| Delaware | 248 | 125 | - | - | 427 | 113 | 56 | 969 | 15 |
| Florida | - | - | 112 | - | 242 | 118 | 68 | 540 | 47 |
| Georgia | 83 | - | 138 | 46 | 367 | 174 | 48 | 856 | 25 |
| Idaho | 102 | - | 123 | - | 364 | 122 | 36 | 747 | 36 |
| Illinois | 150 | - | 202 | * | 398 | 139 | 68[4] | 957 | 17 |
| Indiana | 150 | - | 128 | - | 504 | 209 | 24 | 1,015 | 13 |
| Iowa | 276 | - | 101 | - | 514 | 133 | 52 | 1,076 | 11 |
| Kansas | 97 | - | 145 | - | 372 | 168 | 44 | 826 | 32 |
| KENTUCKY | 254 | 220[6] | 151 | - | 314 | 155 | 12 | 1,106 | 10 |
| Louisiana | 55 | - | 88 | 88[7] | 110 | 101 | 44 | 486 | 48 |
| Maine | 39 | - | 144 | - | 614 | 169 | 64 | 1,030 | 12 |
| Maryland | 253 | 126 | 114 | - | 610 | 123 | 40 | 1,266 | 7 |
| Massachusetts | 270 | - | 54 | - | 914 | 273 | 84 | 1,595 | 1 |
| Michigan | 184 | 152 | 119 | - | 543[5] | 116 | 44 | 1,158 | 9 |
| Minnesota | 495 | - | 85 | - | 136[8] | 137 | 72 | 925 | 20 |
| Mississippi | 38 | - | 237 | - | 300 | 213 | 44 | 832 | 31 |
| Missouri | 65 | 100 | 133 | 44 | 394 | 183 | 64[4] | 983 | 14 |
| Montana | 279 | - | - | - | 322 | 159 | 48 | 808 | 34 |
| Nebraska | 25 | - | 117 | 47 | 499 | 201 | 52 | 941 | 19 |
| Nevada | - | - | 135 | * | 314 | 124 | 40 | 613 | 43 |
| New Hampshire | - | - | - | - | 746 | 168 | 48 | 962 | 16 |
| New Jersey | 120 | - | 94 | - | 905 | 130 | 76 | 1,325 | 5 |
| New Mexico | -91[5] | - | 200 | - | 319 | 97 | 48 | 573 | 46 |
| New York | 206 | 91 | 135 | 135[9] | 458 | 133 | 92[4] | 1,250 | 8 |
| North Carolina | 258 | - | 156 | * | 331 | 168 | 8 | 921 | 21 |
| North Dakota | 85 | - | 114 | - | 362 | 123 | 44 | 728 | 37 |
| Ohio | 49 | 100 | 98 | 27[10] | 430 | 86 | 60 | 850 | 28 |
| Oklahoma | 50 | - | 84 | 63 | 254 | 128 | 52 | 631 | 41 |
| Oregon | 299 | - | - | - | 297[8] | 92 | 36 | 724 | 38 |
| Pennsylvania | 200 | 381 | 86 | - | 506 | 117 | 72 | 1,362 | 3 |
| Rhode Island | 76 | - | 147 | - | 744 | 301 | 72 | 1,340 | 4 |
| South Carolina | 156 | - | 172 | - | 276 | 184 | 24 | 812 | 33 |
| South Dakota | - | - | 186 | 47 | 490 | 123 | 48 | 894 | 23 |
| Tennessee | - | - | 176[11] | 62 | 262 | 109 | 56[4] | 665 | 40 |
| Texas | - | - | 109 | 27 | 250 | 146 | 74 | 606 | 44 |
| Utah | 201 | - | 214 | * | 218 | 168 | 32 | 833 | 30 |
| Vermont | 112 | - | 67 | - | 500[8] | 125 | 48 | 852 | 26 |
| Virginia | 175 | - | 150 | * | 247 | 230 | 50[4] | 852 | 26 |
| Washington | - | - | 216 | * | 211 | 184 | 64 | 675 | 39 |
| West Virginia | 145 | - | 126 | - | 94 | 165 | 48 | 578 | 45 |
| Wisconsin | 331 | - | 131 | - | 794 | 90 | 64 | 1,410 | 2 |
| Wyoming | - | - | 136 | - | 288 | 164 | 32 | 620 | 42 |

Note: See footnotes following Table 1.

SOURCE: Author's computations.

TABLE 3

FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
FAMILY C: $15,000 ADJUSTED GROSS INCOME
(Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $224 | $150 | $202 | $101 | $ 173 | $141 | $64[4] | $1,055 | 32 |
| Arizona | 200 | - | 217 | 54 | 460 | 172 | 52 | 1,155 | 23 |
| Arkansas | 261 | - | 167 | - | 328 | 159 | 71 | 986 | 35 |
| California | 171 | - | 220 | * | 715 | 153 | 40 | 1,299 | 17 |
| Colorado | 164 | - | 160 | 160 | 419 | 135 | 40 | 1,078 | 28 |
| Connecticut | - | - | 223 | - | 973 | 300 | 84 | 1,580 | 8 |
| Delaware | 405 | 187 | - | - | 561 | 113 | 56 | 1,322 | 14 |
| Florida | - | - | 152 | - | 318 | 118 | 68 | 656 | 48 |
| Georgia | 181 | - | 177 | 59 | 482 | 174 | 48 | 1,121 | 25 |
| Idaho | 271 | - | 155 | - | 479 | 122 | 36 | 1,063 | 30 |
| Illinois | 275 | - | 255 | * | 523 | 139 | 68[4] | 1,260 | 20 |
| Indiana | 250 | - | 171 | - | 662 | 209 | 24 | 1,316 | 15 |
| Iowa | 355 | - | 138 | - | 674 | 133 | 52 | 1,352 | 12 |
| Kansas | 181 | - | 185 | - | 488 | 168 | 44 | 1,066 | 29 |
| KENTUCKY | 307 | 330[6] | 201 | - | 413 | 155 | 12 | 1,418 | 11 |
| Louisiana | 138 | - | 119 | 119[7] | 145 | 101 | 44 | 666 | 47 |
| Maine | 103 | - | 189 | - | 806 | 169 | 64 | 1,331 | 13 |
| Maryland | 338 | 169 | 151 | - | 800 | 123 | 40 | 1,621 | 7 |
| Massachusetts | 497 | - | 75 | - | 1,200 | 273 | 84 | 2,129 | 1 |
| Michigan | 116 | 252 | 159 | - | 753[8] | 116 | 44 | 1,440 | 9 |
| Minnesota | 724 | - | 115 | - | 234 | 137 | 72 | 1,282 | 19 |
| Mississippi | 106 | - | 205 | - | 394 | 213 | 44 | 962 | 36 |
| Missouri | 155 | 150 | 170 | 56 | 517 | 183 | 64[4] | 1,295 | 18 |
| Montana | 332 | - | - | - | 422 | 159 | 48 | 961 | 37 |
| Nebraska | 200 | - | 148 | 59 | 655 | 201 | 52 | 1,315 | 16 |
| Nevada | - | - | 168 | * | 413 | 124 | 40 | 745 | 44 |
| New Hampshire | - | - | - | - | 980 | 168 | 48 | 1,196 | 21 |
| New Jersey | 220 | - | 134 | - | 1,187 | 130 | 76 | 1,747 | 5 |
| New Mexico | 13 | - | 251 | - | 419 | 97 | 48 | 828 | 39 |
| New York | 354 | 149 | 177 | 177[9] | 602 | 133 | 92[4] | 1,684 | 6 |
| North Carolina | 381 | - | 201 | * | 434 | 168 | 8 | 1,192 | 22 |
| North Dakota | 158 | - | 154 | - | 476 | 123 | 44 | 955 | 38 |
| Ohio | 123 | 150 | 134 | 34[10] | 564 | 86 | 60 | 1,151 | 24 |
| Oklahoma | 91 | - | 109 | 82 | 334 | 128 | 52 | 796 | 42 |
| Oregon | 301 | - | - | - | 622 | 92 | 36 | 1,051 | 33 |
| Pennsylvania | 300 | 571 | 126 | - | 665 | 117 | 72 | 1,851 | 3 |
| Rhode Island | 235 | - | 195 | - | 977 | 301 | 72 | 1,780 | 4 |
| South Carolina | 254 | - | 221 | - | 362 | 184 | 24 | 1,045 | 34 |
| South Dakota | - | - | 237 | 59 | 643 | 123 | 48 | 1,110 | 26 |
| Tennessee | - | - | 226[11] | 79 | 343 | 109 | 56[4] | 813 | 40 |
| Texas | - | - | 144 | 36 | 328 | 146 | 74 | 728 | 45 |
| Utah | 308 | - | 268 | * | 287 | 168 | 32 | 1,063 | 30 |
| Vermont | 345 | - | 89 | - | 825[8] | 125 | 48 | 1,432 | 10 |
| Virginia | 308 | - | 192 | * | 324 | 230 | 50[4] | 1,104 | 27 |
| Washington | - | - | 272 | * | 277 | 184 | 64 | 797 | 41 |
| West Virginia | 198 | - | 162 | - | 123 | 165 | 48 | 696 | 46 |
| Wisconsin | 551 | - | 176 | - | 1,042 | 90 | 64 | 1,923 | 2 |
| Wyoming | - | - | 172 | - | 378 | 164 | 32 | 746 | 43 |

Note: See footnotes following Table 1.

SOURCE: Author's computations.

TABLE 4

FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
FAMILY D: $17,500 ADJUSTED GROSS INCOME
(Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $325 | $175 | $223 | $112 | $ 192 | $141 | $64[4] | $1,232 | 32 |
| Arizona | 298 | - | 237 | 59 | 511 | 172 | 52 | 1,329 | 23 |
| Arkansas | 369 | - | 184 | - | 364 | 159 | 71 | 1,147 | 38 |
| California | 273 | - | 248 | * | 795 | 153 | 40 | 1,509 | 17 |
| Colorado | 293 | - | 175 | 175 | 465 | 135 | 40 | 1,283 | 28 |
| Connecticut | - | - | 253 | - | 1,081 | 300 | 84 | 1,718 | 9 |
| Delaware | 617 | 219 | - | - | 623 | 113 | 56 | 1,628 | 12 |
| Florida | - | - | 169 | - | 353 | 118 | 68 | 708 | 48 |
| Georgia | 299 | - | 195 | 65 | 535 | 174 | 48 | 1,316 | 24 |
| Idaho | 434 | - | 170 | - | 532 | 122 | 36 | 1,294 | 27 |
| Illinois | 338 | - | 278 | * | 581 | 139 | 68[4] | 1,404 | 22 |
| Indiana | 300 | - | 191 | - | 735 | 209 | 24 | 1,459 | 20 |
| Iowa | 495 | - | 155 | - | 749 | 133 | 52 | 1,584 | 14 |
| Kansas | 261 | - | 203 | - | 542 | 168 | 44 | 1,218 | 33 |
| KENTUCKY | 427 | 385[6] | 224 | - | 458 | 155 | 12 | 1,661 | 11 |
| Louisiana | 167 | - | 134 | 134[7] | 161 | 101 | 44 | 741 | 47 |
| Maine | 183 | - | 211 | - | 896 | 169 | 64 | 1,523 | 16 |
| Maryland | 459 | 229 | 169 | - | 889 | 123 | 40 | 1,909 | 7 |
| Massachusetts | 622 | - | 85 | - | 1,333 | 273 | 84 | 2,397 | 1 |
| Michigan | 183 | 302 | 179 | - | 853[8] | 116 | 44 | 1,677 | 10 |
| Minnesota | 980 | - | 130 | - | 268[8] | 137 | 72 | 1,587 | 13 |
| Mississippi | 189 | - | 335 | - | 437 | 213 | 44 | 1,218 | 33 |
| Missouri | 243 | 175 | 185 | 62 | 574 | 183 | 64[4] | 1,486 | 18 |
| Montana | 477 | - | - | - | 469 | 159 | 48 | 1,153 | 37 |
| Nebraska | 275 | - | 163 | 65 | 728 | 201 | 52 | 1,484 | 19 |
| Nevada | - | - | 184 | * | 458 | 124 | 40 | 806 | 43 |
| New Hampshire | - | - | - | - | 1,088 | 168 | 48 | 1,304 | 26 |
| New Jersey | 270 | - | 154 | - | 1,319 | 130 | 76 | 1,949 | 6 |
| New Mexico | 89 | - | 274 | - | 465 | 97 | 48 | 973 | 39 |
| New York | 519 | 209 | 196 | 199[9] | 668 | 133 | 92[4] | 2,016 | 4 |
| North Carolina | 536 | - | 221 | * | 483 | 168 | 8 | 1,416 | 21 |
| North Dakota | 301 | - | 172 | - | 528 | 123 | 44 | 1,168 | 36 |
| Ohio | 173 | 175 | 152 | 38[10] | 626 | 86 | 60 | 1,310 | 25 |
| Oklahoma | 161 | - | 121 | 91 | 371 | 128 | 52 | 924 | 40 |
| Oregon | 581 | - | - | - | 819 | 92 | 36 | 1,528 | 15 |
| Pennsylvania | 350 | 667 | 146 | - | 738 | 117 | 72 | 2,090 | 3 |
| Rhode Island | 305 | - | 218 | - | 1,085 | 301 | 72 | 1,981 | 5 |
| South Carolina | 393 | - | 244 | - | 402 | 184 | 24 | 1,247 | 30 |
| South Dakota | - | - | 260 | 65 | 714 | 123 | 48 | 1,210 | 35 |
| Tennessee | - | - | 249[11] | 87 | 381 | 109 | 56[4] | 882 | 41 |
| Texas | - | - | 162 | 41 | 364 | 146 | 74 | 787 | 46 |
| Utah | 456 | - | 293 | * | 318 | 168 | 32 | 1,267 | 29 |
| Vermont | 448 | - | 100 | - | 1,050[8] | 125 | 48 | 1,771 | 8 |
| Virginia | 392 | - | 212 | * | 360 | 230 | 50[4] | 1,244 | 31 |
| Washington | - | - | 298 | * | 308 | 184 | 64 | 854 | 42 |
| West Virginia | 265 | - | 180 | - | 136 | 165 | 48 | 794 | 45 |
| Wisconsin | 771 | - | 198 | - | 1,158 | 90 | 64 | 2,281 | 2 |
| Wyoming | - | - | 187 | - | 420 | 164 | 32 | 803 | 44 |

Note: See footnotes following Table 1.

SOURCE: Author's computations.

TABLE 5

FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
FAMILY E: $25,000 ADJUSTED GROSS INCOME
(Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $ 573 | $250 | $262 | $131 | $ 247 | $141 | $64[4] | $1,668 | 33 |
| Arizona | 616 | - | 278 | 70 | 657 | 172 | 52 | 1,845 | 24 |
| Arkansas | 726 | - | 216 | - | 468 | 159 | 71 | 1,640 | 36 |
| California | 636 | - | 295 | * | 1,021 | 153 | 40 | 2,145 | 16 |
| Colorado | 653 | - | 205 | 205 | 598 | 135 | 40 | 1,836 | 26 |
| Connecticut | - | - | 305 | - | 1,390 | 300 | 84 | 2,079 | 17 |
| Delaware | 1,172 | 312 | - | - | 801 | 113 | 56 | 2,454 | 10 |
| Florida | - | - | 201 | - | 454 | 118 | 68 | 841 | 48 |
| Georgia | 669 | - | 229 | 76 | 688 | 174 | 48 | 1,884 | 22 |
| Idaho | 906 | - | 200 | - | 684 | 122 | 36 | 1,948 | 21 |
| Illinois | 525 | - | 325 | * | 747 | 139 | 68[4] | 1,804 | 28 |
| Indiana | 450 | - | 228 | - | 945 | 209 | 24 | 1,856 | 23 |
| Iowa | 861 | - | 185 | - | 963 | 133 | 52 | 2,194 | 14 |
| Kansas | 499 | - | 238 | - | 697 | 168 | 44 | 1,646 | 35 |
| KENTUCKY | 726 | 550[6] | 266 | - | 589 | 155 | 12 | 2,298 | 12 |
| Louisiana | 247 | - | 160 | 160[7] | 207 | 101 | 44 | 919 | 47 |
| Maine | 513 | - | 250 | - | 1,152 | 169 | 64 | 2,148 | 15 |
| Maryland | 774 | 387 | 205 | - | 1,143 | 123 | 40 | 2,672 | 5 |
| Massachusetts | 1,012 | - | 102 | - | 1,714 | 273 | 84 | 3,185 | 2 |
| Michigan | 354 | 452 | 212 | - | 1,150[8] | 116 | 44 | 2,328 | 11 |
| Minnesota | 1,668 | - | 154 | - | 503[8] | 137 | 72 | 2,534 | 7 |
| Mississippi | 444 | - | 395 | - | 562 | 213 | 44 | 1,658 | 34 |
| Missouri | 531 | 250 | 217 | 72 | 738 | 183 | 64[4] | 2,055 | 18 |
| Montana | 907 | - | - | - | 603 | 159 | 48 | 1,717 | 32 |
| Nebraska | 514 | - | 190 | 76 | 936 | 201 | 52 | 1,969 | 20 |
| Nevada | - | - | 217 | * | 589 | 124 | 40 | 970 | 44 |
| New Hampshire | - | - | - | - | 1,399 | 168 | 48 | 1,615 | 37 |
| New Jersey | 425 | - | 185 | - | 1,696 | 130 | 76 | 2,512 | 8 |
| New Mexico | 355 | - | 322 | - | 598 | 97 | 48 | 1,420 | 39 |
| New York | 1,091 | 392 | 233 | 237[9] | 859 | 133 | 92[4] | 3,037 | 3 |
| North Carolina | 982 | - | 261 | * | 621 | 168 | 8 | 2,040 | 19 |
| North Dakota | 769 | - | 205 | - | 679 | 123 | 44 | 1,820 | 27 |
| Ohio | 372 | 250 | 182 | 46[10] | 805 | 86 | 60 | 1,801 | 29 |
| Oklahoma | 439 | - | 142 | 107 | 477 | 128 | 52 | 1,345 | 40 |
| Oregon | 1,066 | - | - | - | 1,053 | 92 | 36 | 2,247 | 13 |
| Pennsylvania | 590 | 952 | 176 | - | 949 | 117 | 72 | 2,766 | 4 |
| Rhode Island | 531 | - | 259 | - | 1,395 | 301 | 72 | 2,558 | 6 |
| South Carolina | 833 | - | 286 | - | 517 | 184 | 24 | 1,844 | 25 |
| South Dakota | - | - | 306 | 77 | 918 | 123 | 48 | 1,472 | 38 |
| Tennessee | - | - | 294[11] | 103 | 490 | 109 | 56[4] | 1,052 | 42 |
| Texas | - | - | 191 | 48 | 468 | 146 | 74 | 927 | 46 |
| Utah | 841 | - | 344 | * | 409 | 168 | 32 | 1,794 | 30 |
| Vermont | 780 | - | 119 | - | 1,395[8] | 125 | 48[4] | 2,467 | 9 |
| Virginia | 785 | - | 249 | * | 463 | 230 | 50 | 1,777 | 31 |
| Washington | - | - | 352 | * | 396 | 184 | 64 | 996 | 43 |
| West Virginia | 468 | - | 211 | - | 175 | 165 | 48 | 1,067 | 41 |
| Wisconsin | 1,411 | - | 235 | - | 1,489 | 90 | 64 | 3,289 | 1 |
| Wyoming | - | - | 220 | - | 540 | 164 | 32 | 956 | 45 |

Note: See footnotes following Table 1.

SOURCE: Author's computations.

## TABLE 6

### FAMILY TAX BURDENS, BY TYPE OF TAX AND BY STATE OF RESIDENCE
### FAMILY F: $50,000 ADJUSTED GROSS INCOME
### (Largest City of Each State)

| State[1] | Individual Income | | General Sales | | Residential Property | Motor Vehicle[2] | Cigarette Excise | Total Tax Burden | Rank[3] |
|---|---|---|---|---|---|---|---|---|---|
| | State | Local | State | Local | | | | | |
| Alabama | $1,313 | $ 500 | $380 | $190 | $ 412 | $141 | $64[4] | $3,000 | 38 |
| Arizona | 1,712 | - | 405 | 101 | 1,095 | 172 | 52 | 3,537 | 26 |
| Arkansas | 2,232 | - | 314 | - | 780 | 159 | 71 | 3,556 | 24 |
| California | 2,818 | - | 429 | * | 1,702 | 153 | 40 | 5,142 | 8 |
| Colorado | 1,787 | - | 298 | 298 | 997 | 135 | 40 | 3,555 | 25 |
| Connecticut | - | - | 443 | - | 2,317 | 300 | 84 | 3,144 | 33 |
| Delaware | 3,543 | 625 | - | - | 1,335 | 113 | 56 | 5,675 | 5 |
| Florida | - | - | 293 | - | 757 | 118 | 68 | 1,236 | 48 |
| Georgia | 2,004 | - | 333 | 111 | 1,147 | 174 | 48 | 3,817 | 21 |
| Idaho | 2,574 | - | 291 | - | 1,140 | 122 | 36 | 4,163 | 17 |
| Illinois | 1,150 | - | 472 | * | 1,245 | 139 | 68[4] | 3,074 | 36 |
| Indiana | 950 | - | 331 | - | 1,575 | 209 | 24 | 3,089 | 35 |
| Iowa | 2,242 | - | 269 | - | 1,605 | 133 | 52 | 4,301 | 15 |
| Kansas | 1,542 | - | 346 | - | 1,162 | 168 | 44 | 3,265 | 31 |
| KENTUCKY | 1,614 | 1,100[6] | 387 | - | 982 | 155 | 12 | 4,250 | 16 |
| Louisiana | 742 | - | 232 | 232[7] | 345 | 101 | 44 | 1,696 | 42 |
| Maine | 2,331 | - | 363 | - | 1,920 | 169 | 64 | 4,847 | 12 |
| Maryland | 1,886 | 943 | 293 | - | 1,905 | 123 | 40 | 5,190 | 7 |
| Massachusetts | 2,313 | - | 149 | - | 2,857 | 273 | 84 | 5,676 | 4 |
| Michigan | 1,299 | 942 | 309 | - | 2,091[8] | 116 | 44 | 4,801 | 13 |
| Minnesota | 3,855 | - | 224 | - | 1,400[8] | 137 | 72 | 5,688 | 3 |
| Mississippi | 1,339 | - | 574 | - | 937 | 213 | 44 | 3,107 | 34 |
| Missouri | 1,419 | 500 | 315 | 105 | 1,230 | 183 | 64[4] | 3,816 | 22 |
| Montana | 2,246 | - | - | - | 1,005 | 159 | 48 | 3,458 | 28 |
| Nebraska | 1,854 | - | 277 | 111 | 1,560 | 201 | 52 | 4,055 | 19 |
| Nevada | - | - | 315 | * | 982 | 124 | 40 | 1,461 | 44 |
| New Hampshire | - | - | - | - | 2,332 | 168 | 48 | 2,548 | 39 |
| New Jersey | 1,050 | - | 269 | - | 2,827 | 130 | 76 | 4,352 | 14 |
| New Mexico | 1,808 | - | 469 | - | 997 | 97 | 48 | 3,419 | 29 |
| New York | 4,239 | 1,300 | 339 | 340[9] | 1,432 | 133 | 92[4] | 7,875 | 1 |
| North Carolina | 2,545 | - | 379 | * | 1,035 | 168 | 8 | 4,135 | 18 |
| North Dakota | 2,161 | - | 298 | - | 1,132 | 123 | 44 | 3,758 | 23 |
| Ohio | 1,159 | 500 | 264 | 66[10] | 1,342 | 86 | 60 | 3,477 | 32 |
| Oklahoma | 1,677 | - | 206 | 155 | 795 | 128 | 52 | 3,013 | 37 |
| Oregon | 3,103 | - | - | - | 1,755 | 92 | 36 | 4,986 | 9 |
| Pennsylvania | 1,000 | 1,905 | 256 | - | 1,582 | 117 | 72 | 4,932 | 10 |
| Rhode Island | 1,796 | - | 376 | - | 2,325 | 301 | 72 | 4,870 | 11 |
| South Carolina | 2,390 | - | 416 | - | 862 | 184 | 24 | 3,876 | 20 |
| South Dakota | - | - | 445 | 111 | 1,530 | 123 | 48 | 2,257 | 41 |
| Tennessee | - | - | 427[11] | 149 | 817 | 109 | 56[4] | 1,558 | 43 |
| Texas | - | - | 278 | 70 | 780 | 146 | 74 | 1,348 | 47 |
| Utah | 1,988 | - | 501 | * | 682 | 168 | 32 | 3,371 | 30 |
| Vermont | 2,641 | - | 173 | - | 2,325 | 125 | 48 | 5,312 | 6 |
| Virginia | 2,064 | - | 352 | * | 772 | 230 | 50[4] | 3,478 | 27 |
| Washington | - | - | 512 | * | 660 | 184 | 64 | 1,420 | 45 |
| West Virginia | 1,509 | - | 307 | - | 292 | 165 | 48 | 2,321 | 40 |
| Wisconsin | 3,687 | - | 342 | - | 2,482 | 90 | 64 | 6,665 | 2 |
| Wyoming | - | - | 320 | - | 900 | 164 | 32 | 1,416 | 46 |

Note: See footnotes following Table 1.

SOURCE: Author's computations.

## Relative Tax Burdens by Income Level

The ranking of states shown in Tables 1 through 6 is rather crude. A more precise comparison can be made by expressing each family's total tax burden as a percent of the all-state average. The resulting calculations of relative tax burdens show at a glance how a given state compares with the average and with any other state. A number greater than 100 indicates a higher-than-average tax burden whereas a number less than 100 means a lower-than-average burden.

Table 7 shows family tax burdens expressed as relatives along with 1976 per capita taxes for each state also expressed as relatives. Columns 2 through 7 show that a given state's relative position varies greatly with family income level. Oregon and New Hampshire are good examples. Tax burdens in Portland, Oregon increase from 56 percent to 134 percent of the all-state average as family income increases from $7,500 to $50,000. In contrast, relative burdens decline in Manchester, New Hampshire from 115 percent to 68 percent of the average over this same income range.

Generally, states without a broadly-based income tax decline in relative burden as income rises; Nevada, Florida, New Jersey, South Dakota, Tennessee, Connecticut, and Washington are examples. In contrast, states that have comprehensive income taxes and that do not allow or limit deduction of federal income taxes in computing state income taxes decline only slightly or even show increases in relative burden as the level of family income rises; New York, Oregon, and Vermont are examples of this group.

Kentucky's relative tax burden varies by level of family income but the variation is fairly small. Tax burdens for a hypothetical Louisville family are above average at all income levels studied, with the exception of the $50,000 level. The contrast between Kentucky and Tennessee is striking. While the relative burden in Louisville falls slightly as a percent of the all-state average over the income range, it declines in Memphis, Tennessee from 79 percent to 42 percent.

## Family Tax Burdens Compared with Taxes Per Capita

The finding that states' relative tax positions depend on the level of income at which the comparison is made is not surprising; however, it does serve to emphasize again the inadequacy of any measure of tax burden that is based on a single average figure. Calculations based on taxes per capita suffer from this defect and also from an incorrect treatment of business taxes. As indicated earlier, in computing taxes per capita, all business taxes collected within a given state are counted as a burden on families residing in that state. The error is compounded by the failure to recognize that business taxes levied in other states may become a burden on residents of the given state. By ignoring tax exporting, the taxes per capita measure overstates resident tax burdens in states that are net tax exporters and understates burdens in states that are net tax importers. Family tax burdens avoid the problem of tax exporting by omitting business taxes, which account for the bulk of tax exporting. This causes resident tax burdens to be understated in all states. But the degree of understatement is likely to be similar for all states because business taxes are believed to be diffused fairly equally among families of similar income and expenditure size regardless of state of residence.[9] The family tax burden concept is therefore a better indicator of differences among states in tax burdens. However, this approach does assume that the tax burden in the largest city is reflective of the entire state.

The different results obtained from the taxes per capita and family tax burden measures can be seen by comparing column 1 with columns 2 through 7 of Table 7. Kentucky and several other states that are shown to be relatively low in terms of taxes per capita appear much higher in terms of family tax burden. In contrast, several states that are high in taxes per capita are much lower in terms of family tax burdens. In general these are states that one would expect to have a high capacity for exporting taxes.[10]

The measure used has a striking effect in comparing tax burdens for Kentucky with neighboring Tennessee. Per capita taxes are only 9 percentage points higher for Kentucky, but Kentucky is much higher than Tennessee in terms of family tax burden. Much of this difference can be explained by unequal reliance on business taxes. Business tax receipts are a lower percentage of total tax collections in Kentucky because of lower business tax rates and because Kentucky simply has less business to tax.[11] Kentucky therefore is compelled to make greater use of personal taxes, the burdens of which are for the most part borne by Kentucky residents. The 1972 increase in Kentucky's corporation income tax and the enactment of the coal severance tax served to increase Kentucky's ability to export taxes as well as the obvious purpose of financing sales tax relief.

## Degree of Tax Regression

Distribution of the state-local tax load among different income classes can be distinguished from tax burden levels. The relative tax burdens shown in Table 7 suggest that states differ in degree of tax regression. A clearer indication of this is provided by dividing dollar estimates of family tax burden by the respective family income levels. Table 8 shows tax burdens stated as a percent of family income for each of the six income levels studied.

TABLE 7

RELATIVE TAX BURDENS: FAMILY BURDENS COMPARED BY INCOME LEVEL AND WITH TAXES PER CAPITA, LARGEST CITY OF 48 STATES, 1976
(Percentages of Forty-Eight State Average)

| State | Total Taxes Per Capita Fiscal 1976 | Adjusted Gross Income, Family of Four, 1976 | | | | | |
|---|---|---|---|---|---|---|---|
| | | $7,500 | $10,000 | $15,000 | $17,500 | $25,000 | $50,000 |
| Alabama | 68% | 94% | 91% | 89% | 89% | 88% | 80% |
| Arizona | 109 | 108 | 104 | 97 | 96 | 97 | 95 |
| Arkansas | 67 | 86 | 85 | 83 | 83 | 86 | 95 |
| California | 144 | 107 | 99 | 109 | 109 | 113 | 138 |
| Colorado | 108 | 97 | 97 | 91 | 93 | 97 | 95 |
| Connecticut | 116 | 154 | 141 | 133 | 124 | 110 | 84 |
| Delaware | 114 | 103 | 106 | 111 | 118 | 129 | 152 |
| Florida | 84 | 65 | 59 | 55 | 51 | 44 | 33 |
| Georgia | 82 | 97 | 94 | 94 | 95 | 99 | 102 |
| Idaho | 88 | 77 | 82 | 89 | 94 | 103 | 112 |
| Illinois | 115 | 109 | 105 | 106 | 102 | 95 | 82 |
| Indiana | 88 | 117 | 111 | 110 | 106 | 98 | 83 |
| Iowa | 104 | 117 | 118 | 114 | 115 | 116 | 115 |
| Kansas | 97 | 94 | 90 | 90 | 88 | 87 | 87 |
| KENTUCKY | 82 | 117 | 121 | 119 | 120 | 121 | 114 |
| Louisiana | 91 | 51 | 53 | 56 | 54 | 48 | 45 |
| Maine | 100 | 120 | 113 | 112 | 110 | 113 | 130 |
| Maryland | 121 | 130 | 139 | 136 | 138 | 141 | 139 |
| Massachusetts | 134 | 178 | 175 | 179 | 174 | 168 | 152 |
| Michigan | 112 | 117 | 127 | 121 | 121 | 123 | 129 |
| Minnesota | 123 | 64 | 101 | 108 | 115 | 134 | 153 |
| Mississippi | 72 | 96 | 91 | 81 | 88 | 87 | 83 |
| Missouri | 85 | 111 | 108 | 109 | 108 | 108 | 102 |
| Montana | 106 | 85 | 88 | 81 | 83 | 90 | 93 |
| Nebraska | 98 | 104 | 103 | 110 | 107 | 104 | 109 |
| Nevada | 122 | 74 | 67 | 63 | 58 | 51 | 39 |
| New Hampshire | 85 | 115 | 105 | 100 | 94 | 85 | 68 |
| New Jersey | 118 | 151 | 145 | 147 | 141 | 132 | 117 |
| New Mexico | 89 | 62 | 63 | 70 | 70 | 75 | 92 |
| New York | 170 | 132 | 137 | 141 | 146 | 160 | 211 |
| North Carolina | 79 | 97 | 101 | 100 | 103 | 107 | 111 |
| North Dakota | 99 | 81 | 80 | 80 | 85 | 96 | 101 |
| Ohio | 87 | 96 | 93 | 97 | 95 | 95 | 93 |
| Oklahoma | 79 | 73 | 69 | 67 | 67 | 71 | 81 |
| Oregon | 105 | 56 | 79 | 88 | 111 | 118 | 134 |
| Pennsylvania | 102 | 150 | 149 | 155 | 151 | 146 | 132 |
| Rhode Island | 106 | 152 | 147 | 149 | 143 | 135 | 131 |
| South Carolina | 73 | 91 | 89 | 88 | 90 | 97 | 104 |
| South Dakota | 89 | 106 | 98 | 93 | 88 | 78 | 61 |
| Tennessee | 73 | 79 | 73 | 68 | 64 | 55 | 42 |
| Texas | 87 | 73 | 66 | 61 | 57 | 49 | 36 |
| Utah | 88 | 91 | 91 | 89 | 92 | 95 | 90 |
| Vermont | 111 | 78 | 93 | 120 | 128 | 130 | 142 |
| Virginia | 91 | 95 | 93 | 93 | 90 | 94 | 93 |
| Washington | 108 | 83 | 74 | 67 | 62 | 52 | 38 |
| West Virginia | 87 | 66 | 63 | 58 | 57 | 56 | 62 |
| Wisconsin | 118 | 128 | 154 | 161 | 165 | 173 | 179 |
| Wyoming | 126 | 75 | 68 | 63 | 58 | 50 | 38 |

SOURCE: U.S. Bureau of Census, *Governmental Finances in 1975-76*, Table 22; author's computations.

TABLE 8

DISTRIBUTION OF MAJOR STATE-LOCAL TAX BURDENS RELATIVE TO FAMILY INCOME SIZE, COMPARISONS FOR LARGEST CITY OF EACH STATE, 1976
(Tax Burdens as Percentages of Income)

| | Adjusted Gro ncome, Family of Four | | | | | |
|---|---|---|---|---|---|---|
| | $7,500 | $10,000 | $15,000 | $17,500 | $25,000 | $50,000 |
| All States | 9.8% | 9.1% | 7.9% | 7.9% | 7.6% | 7.5% |
| Alabama | 9.3 | 8.4 | 7.0 | 7.0 | 6.7 | 6.0 |
| Arizona | 10.6 | 9.5 | 7.7 | 7.6 | 7.4 | 7.1 |
| Arkansas | 8.4 | 7.7 | 6.6 | 6.6 | 6.6 | 7.1 |
| California | 10.5 | 9.0 | 8.7 | 8.6 | 8.6 | 10.3 |
| Colorado | 9.6 | 8.9 | 7.2 | 7.3 | 7.3 | 7.1 |
| Connecticut | 15.2 | 12.9 | 10.5 | 9.8 | 8.3 | 6.3 |
| Delaware | 10.1 | 9.7 | 8.8 | 9.3 | 9.8 | 11.3 |
| Florida | 6.4 | 5.4 | 4.4 | 4.0 | 3.4 | 2.5 |
| Georgia | 9.5 | 8.6 | 7.5 | 7.5 | 7.5 | 7.6 |
| Idaho | 7.6 | 7.5 | 7.1 | 7.4 | 7.8 | 8.3 |
| Illinois | 10.7 | 9.6 | 8.4 | 8.0 | 7.2 | 6.1 |
| Indiana | 11.5 | 10.2 | 8.8 | 8.3 | 7.4 | 6.2 |
| Iowa | 11.6 | 10.8 | 9.0 | 9.1 | 8.8 | 8.6 |
| Kansas | 9.3 | 8.3 | 7.1 | 7.0 | 6.6 | 6.5 |
| KENTUCKY | 11.5 | 11.1 | 9.5 | 9.5 | 9.2 | 8.5 |
| Louisiana | 5.1 | 4.9 | 4.4 | 4.2 | 3.7 | 3.4 |
| Maine | 11.8 | 10.3 | 8.9 | 8.7 | 8.6 | 9.7 |
| Maryland | 12.8 | 12.7 | 10.8 | 10.9 | 10.7 | 10.4 |
| Massachusetts | 17.5 | 16.0 | 14.2 | 13.7 | 12.7 | 11.4 |
| Michigan | 11.5 | 11.6 | 9.6 | 9.6 | 9.3 | 9.6 |
| Minnesota | 6.3 | 9.3 | 8.5 | 9.1 | 10.1 | 11.4 |
| Mississippi | 9.4 | 8.3 | 6.4 | 7.0 | 6.6 | 6.2 |
| Missouri | 10.9 | 9.8 | 8.6 | 8.5 | 8.2 | 7.6 |
| Montana | 8.4 | 8.1 | 6.4 | 6.6 | 6.9 | 6.9 |
| Nebraska | 10.2 | 9.4 | 8.8 | 8.5 | 7.9 | 8.1 |
| Nevada | 7.3 | 6.1 | 5.0 | 4.6 | 3.9 | 2.9 |
| New Hampshire | 11.3 | 9.6 | 8.0 | 7.5 | 6.5 | 5.1 |
| New Jersey | 14.8 | 13.3 | 11.6 | 11.1 | 10.0 | 8.7 |
| New Mexico | 6.1 | 5.7 | 5.5 | 5.6 | 5.7 | 6.8 |
| New York | 13.0 | 12.5 | 11.2 | 11.5 | 12.1 | 15.8 |
| North Carolina | 9.6 | 9.2 | 7.9 | 8.1 | 8.2 | 8.3 |
| North Dakota | 8.0 | 7.3 | 6.4 | 6.7 | 7.3 | 7.5 |
| Ohio | 9.4 | 8.5 | 7.7 | 7.5 | 7.2 | 7.0 |
| Oklahoma | 7.2 | 6.3 | 5.3 | 5.3 | 5.4 | 6.0 |
| Oregon | 5.5 | 7.2 | 7.0 | 8.7 | 9.0 | 10.0 |
| Pennsylvania | 14.8 | 13.6 | 12.3 | 11.9 | 11.1 | 9.9 |
| Rhode Island | 14.9 | 13.4 | 11.9 | 11.3 | 10.2 | 9.7 |
| South Carolina | 9.0 | 8.1 | 7.0 | 7.1 | 7.4 | 7.8 |
| South Dakota | 10.4 | 8.9 | 7.4 | 6.9 | 5.9 | 4.5 |
| Tennessee | 7.8 | 6.7 | 5.4 | 5.0 | 4.2 | 3.1 |
| Texas | 7.2 | 6.1 | 4.9 | 4.5 | 3.7 | 2.7 |
| Utah | 9.0 | 8.3 | 7.1 | 7.2 | 7.2 | 6.7 |
| Vermont | 7.7 | 8.5 | 9.5 | 10.1 | 9.9 | 10.6 |
| Virginia | 9.3 | 8.5 | 7.4 | 7.1 | 7.1 | 7.0 |
| Washington | 8.1 | 6.8 | 5.3 | 4.9 | 4.0 | 2.8 |
| West Virginia | 6.5 | 5.8 | 4.6 | 4.5 | 4.3 | 4.6 |
| Wisconsin | 12.6 | 14.1 | 12.8 | 13.0 | 13.2 | 13.3 |
| Wyoming | 7.4 | 6.2 | 5.0 | 4.6 | 3.8 | 2.8 |

SOURCE: Author's computations.

Most state-local tax systems, including Kentucky's, exhibit some degree of regression but the degree of regression in Kentucky is slightly above average.

Results from Table 8 are shown graphically in Figure 1 for the following pairs of states: Kentucky-Tennessee; Oregon-Washington; and New Hampshire-Vermont. Figure 1 clearly shows the contrast in state-local tax systems that exists between neighboring states that have much in common in terms of history and geography. Oregon has one of the most progressive tax systems whereas neighboring Washington has one of the most regressive. Kentucky and Tennessee are similar in many respects but the tax burden in Tennessee is distributed much more regressively than in Kentucky.

## Summary and Conclusions

In comparing tax burdens for forty-eight states, major state and local taxes–state income, local income, state sales, local sales, property taxes on homes, motor vehicle taxes, and cigarette excises–were estimated for hypothetical families of given income, consumption, and family size characteristics. Business taxes were omitted because of the uncertainty of their incidence and the consequent difficulty of allocating them correctly among families. It was assumed that each hypothetical family of four owned a home and lived in the largest city of each state.

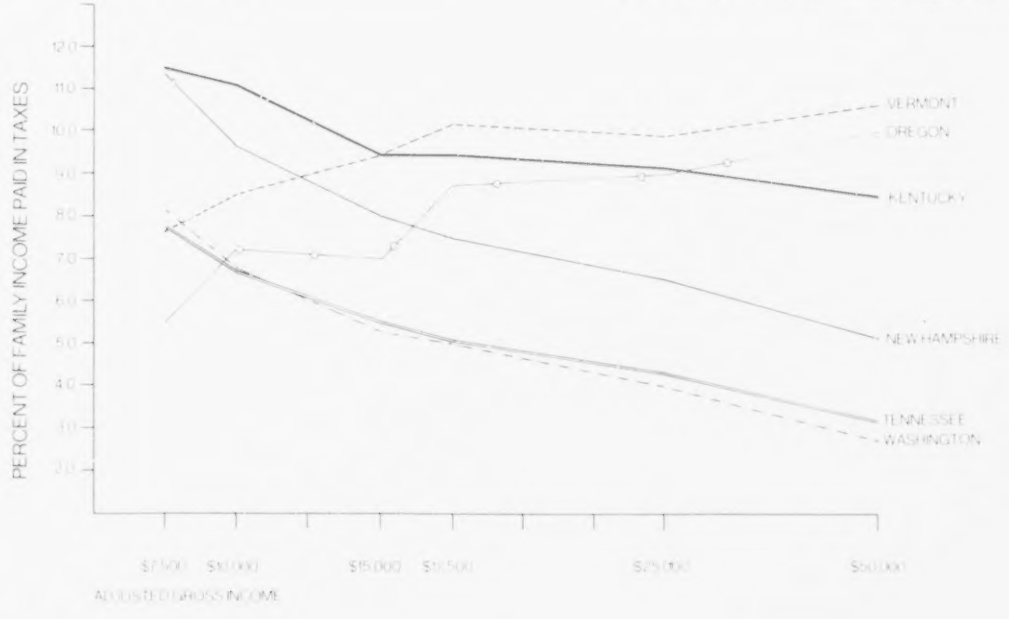
Based on these calculations, estimates for Louisville suggest that tax burdens on typical Kentucky families during 1976 were above average for all income levels studied. Income taxes paid were above average, whereas property and cigarette excise taxes were well below average for all income levels. Motor vehicle taxes were about average and the sales tax was approximately equal to the average combined state-local sales tax paid by similar families residing in other states. The state-local tax burden in Kentucky is distributed less regressively than in many states due to Kentucky's above average use of income-based taxes and the exclusion of food and prescription drugs for the sales tax base.

A major reason why family tax burdens are above average is that Kentucky is a relatively poor state and thus has a relatively low level of economic activity available for taxation. This is particularly apparent with respect to the business tax base. The result is that residents of Kentucky must shoulder an above average tax burden simply in order to finance a near average level of governmental services. The solution must be long term and involves continued economic growth and diversification of the Kentucky economy. In the meantime it is doubtful that significant reductions in family tax burdens can occur in Kentucky unless accompanied by reductions in the growth rate of state and local government spending.

FIGURE 1

Distribution of major state-local tax burdens relative to family income, comparisons of selected states, 1976

(Family of four residing in state's largest city)



## Footnotes

[1]These measures are, however, appropriate indicators of tax effort, which refers to the extent to which a taxing jurisdiction is using its fiscal capacity, without regard for whether the residents of this jurisdiction bear the burden of the taxes used.

[2]Taxes can be distributed either progressively, proportionally, or regressively among income classes. Under a progressive tax, the percent of income paid in taxes rises as taxpayer income rises; under a proportional tax, the percent of income paid in taxes remains constant at different income levels. The percent of income paid in taxes declines under a regressive tax.

[3]The assumption that such important business taxes as corporate income and property are shifted forward to consumers has come under increasing criticism. Recent theoretical work suggests that the corporate income and business property taxes are borne primarily by stockholders and owners of capital generally. If this is in fact the case, it means that the property tax and corporate income tax are far less regressive than formerly believed. But this new incidence view does not alter the above reasoning that a large portion of business taxes become a burden on nonresidents. For a good review of the new view of corporate income and property tax incidence see Henry Aaron, *Who Pays the Property Tax?* (Washington: The Brookings Institution, 1975) and George Break, "The Incidence and Economic Effects of Taxation," in *The Economics of Public Finance*, Alan Blinder, George Break, Peter O. Steiner, and Dick Netzer, eds. (Washington: Brookings, 1974), pp. 138-168.

[4]This concept is explained in Stephen E. Lile and Don M. Soule, "Interstate Differences in Family Tax Burdens," *National Tax Journal* (December 1969), pp. 435-436.

[5]Stephen E. Lile, *Interstate Comparison of Family Tax Burdens with Residence Location Based on Each State's Largest City* (Frankfort: Kentucky Department of Revenue, 1978).

[6]Property taxes are computed by applying effective tax rates (nominal rates adjusted for differences between market value and assessed value) taken from the 1977 *Census of Governments* to the following assumed house values by family income levels: $7,500-$20,250; $10,000-$24,000; $15,000-$31,500; $17,000-$35,000; $25,000-$45,000; and $50,000-$75,000. Adjustments are made for homestead exemptions and property tax "circuit-breakers" where appropriate. Sales taxes are estimated from the Internal Revenue Service Optional Sales Tax Tables for 1976 with appropriate adjustments for local sales taxes. Motor vehicle taxes are computed assuming each family owns a full size Chevrolet with a 350 cubic-inch engine which is driven 12,000 miles annually. Cigarette excises are computed assuming consumption of 400 packs annually per family. All estimates are for 1976 with the exception of state personal income tax, which is computed for 1977 by the Advisory Commission on Intergovernmental Relations, assuming one wage earner per family and income originating exclusively from wages and salaries.

Use of the *largest city* in each state presents some problem in comparing states. First, there are considerable differences in family tax burdens in large and small cities *within* a given state. However the differences are likely to be somewhat similar from state to state, as the author's 1972 study showed (see Footnote 11). Second, the largest cities of different states may vary considerably in size. The only comprehensive way to eliminate these problems would be to compute family tax burdens for *each place* in a given state, then weight the burdens by population and average them over all places in the state. This approach would require resources well beyond what the author has available.

[7]A property tax "circuit breaker" is an upper limit on the amount of property tax a family must pay, based upon a percentage of its income.

[8]Estimates for Family F are open to the criticism that they are based on the assumption that all income is from wages and salaries when in reality a family of this income level would probably derive a substantial portion of its income from dividends, interest, or other nonwage sources. This assumption does overstate local income tax liability in several cities studied. However, it is not likely to change the rankings greatly because several cities, including Louisville, exclude dividends and interest from the tax base. Assuming that all income comes from wages and salaries also has the effect of understating state income tax in a few states (e.g., Tennessee) where only dividends and interest are taxed.

[9]This is explained in Stephen E. Lile and Don M. Soule, "Interstate Differences in Family Tax Burden," *National Tax Journal* (December 1969), pp. 433-445.

[10]Texas, Louisiana, and Nevada are among several states that were estimated on the basis of 1962 data to export in excess of 25 percent of total state-local tax collections. See Charles E. McLure, Jr., "Tax Exporting in the United States: Estimates for 1962," *National Tax Journal* (March 1967), pp. 49-77.

[11]Estimates based on 1969 fiscal year tax data showed that Kentucky and Tennessee collected about 30 and 38 percent, respectively, of total tax revenue from taxes likely to be exported. See Seung Oh Park, Stephen E. Lile, and Don M. Soule, "Tax Exporting and the Fallacy of Taxes Per Capita as a Measure of Personal Tax Burdens Among States," *Taxes–The Tax Magazine* (April 1972), pp. 224-231.

# V. Is Kentucky a Low-Tax or a High-Tax State?

by Don M. Soule

The two previous articles contain an apparent contradiction. The Lynch paper depicts Kentucky as a low-tax state, based on the U.S. Bureau of the Census data showing Kentucky's state-local taxes per capita to be only 74 percent of the national average. The Lile paper, in contrast, shows Kentucky to be well above the national average in family tax burdens, with Kentucky generally ranking about eleventh highest among the states. These differences in results are caused by a difference in concepts. Taxes per capita indicates the amount of business and personal taxable values located in a state and the degree of their use. Family tax burdens exclude business taxes and are estimates of the tax burdens borne by a typical family living in that state. The main differences, therefore, are the degree of a state's reliance on business taxes and the level of business development in the state.

To calculate taxes per capita, the total amount of tax revenue collected by state and local governments in Kentucky, in one year, is divided by the number of people. The result is tax revenue collected, per person, on the average. Included in the total is all tax revenue collected from persons and businesses located in the state. Family tax burdens, in contrast, are estimated amounts of taxes that are paid by (or borne by) a hypothetical family of four persons, with several alternative sizes of family income, and located alternatively in the largest city of each state. Included in family tax burdens are five types of state and local taxes: property tax on the family's residence; sales tax on its taxable purchases; income tax on its taxable income; cigarette excise on its purchases; and the license and fuel taxes on its ownership and use of motor vehicles. These and other taxes, as applied to businesses, are omitted from the family tax burden estimates on the assumption that business taxes in the 50 states are added to selling prices and are generally diffused throughout the nation in a manner not to cause tax burden differences among identical-income families located in different states.

Before attempting to explain why these two methods give widely differing answers to the low-tax versus high-tax question, the problem is highlighted by a comparison of Kentucky and Tennessee based on family tax burdens and taxes per capita in 1968, 1974 and 1977.

The method for computing family tax burdens was first developed in 1969 and illustrated with 1968 data. At that time, Kentucky and Tennessee were very similar in taxes per capita. In fiscal year 1968, both had taxes per capita of 67 percent of the national average. In 1969, these values were 73 percent for Kentucky and 66.5 percent for Tennessee. By averaging these two years, the calendar year amounts are estimated to be 70.3 percent for Kentucky and 66.8 percent for Tennessee, both expressed as percents of the national average. Both were low-tax states, although Tennessee was lower by $12 per average person. In the family tax burden comparisons, however, Kentucky was found to be a high-tax state while Tennessee remained a low-tax state. Family tax burden for a Kentucky family of $10,000 income was 120 percent of the national average while the same family (size and income) living in Tennessee had a tax burden only 85 percent of the national average. The taxes-per-capita difference between states was slight; the family-tax-burden difference was very large.

Expanding on the above example, Table 1 shows dollars of state-local taxes for Kentucky and Tennessee for the three years in which family tax burdens have been computed. The first line of amounts shows taxes per capita while the other lines show family tax burdens for various income levels for a family of four located in Louisville or Memphis. Although the studied income levels were changed slightly between years, the obvious picture is one of lower taxes in Tennessee than in Kentucky, with the difference much larger in family tax burdens than in taxes per capita.

Why this discrepancy? The main reason is the omission of business taxes from the family tax burden computations and their inclusion in taxes per capita. The logical justification for excluding state-local business taxes as a cause of interstate tax burden differences is the assumption that business taxes are included in selling prices and therefore are exported to customers who reside in other states. For example, a family of four with $10,000 income living in either Kentucky or Tennessee would bear the burden of business taxes imposed throughout the 50 states. But most of the goods purchased by the two families are produced in the 48 states other than Kentucky or Tennessee. Consequently, each of these families would bear the same amount of imported business tax burdens from the 48 other states. Their total business tax burdens would

TABLE 1

TAXES PER CAPITA AND FAMILY TAX BURDENS, KENTUCKY AND TENNESSEE, VARIOUS LEVELS OF INCOME, 1968, 1974, 1977
(Dollars of State-Local Taxes, Calendar Years)

| Family Income | 1968 | | 1974 | | 1977 | |
|---|---|---|---|---|---|---|
| | Kentucky | Tennessee | Kentucky | Tennessee | Kentucky | Tennessee |
| | Taxes Per Capita* | | | | | |
| | $ 252 | $ 240 | $ 469 | $ 437 | $ 601 | $ 564 |
| | Family Tax Burdens | | | | | |
| $ 3,500 | 375 | 378 | - | - | - | - |
| 5,000 | 470 | 436 | 477 | 524 | - | - |
| 7,500 | 688 | 526 | 721 | 652 | 863 | 584 |
| 10,000 | 906 | 601 | 903 | 717 | 1,106 | 665 |
| 15,000 | - | - | - | - | 1,418 | 813 |
| 17,500 | 1,153 | 657 | 1,511 | 1,080 | 1,661 | 882 |
| 25,000 | 1,639 | 908 | 2,094 | 1,291 | 2,298 | 1,052 |
| 50,000 | 2,331 | 1,393 | 3,846 | 2,021 | 4,250 | 1,558 |

*Taxes per capita are adjusted to calendar years for 1968 and 1974 by averaging the two fiscal years. The 1977 data are for fiscal year 1976-77.

SOURCE: Stephen E. Lile and Don M. Soule, "Interstate Differences in Family Tax Burdens," *National Tax Journal*, Vol. 22 (December 1969), pp. 433-45; Stephen E. Lile, *Family Tax Burdens Compared Among Cities Located Within Kentucky and Neighboring States* (Frankfort: Kentucky Department of Revenue, December 15, 1975); Stephen E. Lile, *Interstate Comparisons of Family Tax Burdens with Residence Location Bases on Each State's Largest City* (Frankfort: Kentucky Department of Revenue, 1978); U.S. Bureau of Census, *Government Finances*, various years.

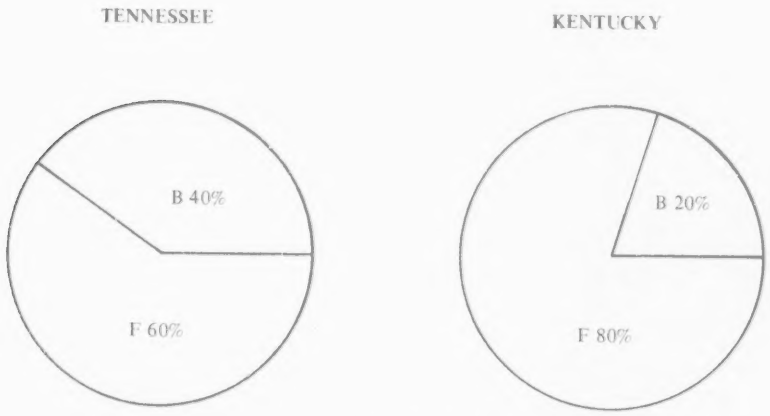
differ only insofar as Kentucky and Tennessee have different levels of business taxes and the two families purchase different amounts of Kentucky- and Tennessee-produced goods. These would have small effects on tax burdens in Kentucky compared with Tennessee. It therefore is assumed that each family bears the same amount of total business tax burden. Because equal business tax burdens could not cause interstate tax burden differences, these amounts are excluded in computing family tax burdens.

With business taxes excluded, the level of family tax burdens could differ between Kentucky and Tennessee, for families of identical income, even if taxes per capita were identical in the two states. For example, the two circles in Figure 1 represent identical levels of taxes per capita in Kentucky and Tennessee, which assumed condition essentially represents the 1968 actual condition. Because the portion of total tax revenue raised from business taxes is larger in Tennessee than in Kentucky, the portion of total tax revenue raised from families is larger in Kentucky than in Tennessee. The burden of Kentucky and Tennessee business taxes is shifted to out-of-state customers, while Kentucky and Tennessee families of $10,000 income bear the same burden of business taxes imported from the other 48 states. The result is higher family tax burdens in Kentucky than in Tennessee.

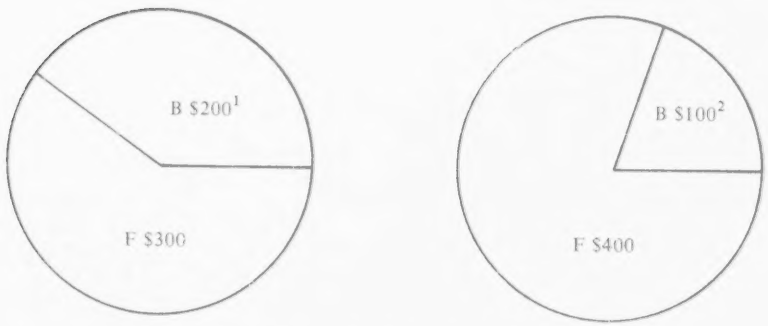
Table 2 illustrates the differences between Kentucky and Tennessee in total taxes and particular tax types, for a family of $10,000 income in 1977, with residence in Louisville and Memphis. Three obvious differences are revealed. First, Kentucky's total exceeds Tennessee's total by $441. Second, Kentucky has state-local income taxes of $474 while Tennessee has none. Third, the totals of taxes other than income taxes are nearly the same in each state, being $632 in Kentucky and $665 in Tennessee. What is not shown, however, is that Tennessee greatly exceeds Kentucky in tax revenue collected from businesses, the burdens of which are mainly exported to customers in the other states. The most important tax difference between the two states, therefore, is in Kentucky's nonexported income taxes and Tennessee's exported business taxes. These comparisons strongly suggest the question: why is Tennessee able to collect a larger portion of its total tax revenue from businesses?

A study published in 1971 attempted to identify the reasons why Tennessee's family tax burdens were much lower than Kentucky's even though taxes-per capita differences were very small.[1] Simply stated, the study concluded that Kentucky in 1968 placed less reliance on business taxes than did Tennessee. In

**Figure 1. Family and Business Portions of Total State-Local Tax Revenue, Hypothetical Example for Tennessee and Kentucky**




Business and Family Portions of Total Tax Revenue Collected in Each State




$500 Taxes Per Capita in Each State

| $1,200 | $1,600 |
|---|---|

Tax Burden of Average-Income Family

[1] Because of exporting and importing, Kentucky and Tennessee business taxes are burdens on customers in the other 48 states, while business taxes in the other 48 states are burdens on customers in Kentucky and Tennessee.

[2] Business taxes are excluded from family tax burden, for reasons explained in text.

TABLE 2

FAMILY TAX BURDENS, BY TYPES OF TAXES, KENTUCKY AND TENNESSEE, 1977
(Family of Four with $10,000 Income)

| | Kentucky | Tennessee | Excess Kentucky Over Tennessee |
|---|---|---|---|
| Income: | | | |
| State | $ 254 | $ - | +254 |
| Local | 220 | - | +220 |
| General Sales: | | | |
| State | 151 | 176 | - 25 |
| Local | - | 62 | - 62 |
| Property | 314 | 262 | + 52 |
| Motor Vehicle | 155 | 109 | + 46 |
| Cigarette Excise | 12 | 56 | - 44 |
| Total | $1,106 | $665 | +441 |

SOURCE: Stephen E. Lile, *Interstate Comparison of Family Tax Burdens with Residence Location Based on Each State's Largest City* (Frankfort: Kentucky Department of Revenue, 1978).

addition, and more importantly, Tennessee was more of a "business" state. Tennessee had a greater proportion of its population in nonagricultural production. This did not cause Tennessee to exceed Kentucky in personal income per capita, however, because the average wage level was higher in Kentucky. But the greater amount of business output in Tennessee, per person on the average, combined with a greater reliance on business taxes, allowed Tennessee to collect a larger proportion of its total tax revenue from businesses–compared with Kentucky. By placing greater reliance on exportable business taxes, Tennessee was able to reduce its family tax burdens–compared with Kentucky.

Which of these two measures–taxes per capita, or family tax burdens–gives the most truthful picture of Kentucky's tax position among the 50 states? If the question is asked by someone interested in comparing the percent of a family's income absorbed by state-local taxes, family tax burdens are the best available indicator. Taxes per capita is extremely misleading when interpreted as a measure of tax burdens on people. For example, a person residing in Tennessee might wish to know whether his family's state-local tax burden would be increased or decreased if he moved to Kentucky. The family might expect its taxes to be only slightly higher in Kentucky, based on taxes per capita. But the family would find that Kentucky collects substantial amounts from income taxes while Tennessee has no income taxes on families, and the sum of all other taxes is essentially the same in the two states. For comparing tax burdens on families, the taxes-per-capita method is seriously misleading. Taxes per capita is, however, a useful measure for other purposes.

Taxes per capita, when used in combination with another measure–taxes as a percent of personal income–accurately measures the differences among states in taxable *ability* (the amount of economic values available to be taxed) and tax *effort* (the degree to which that ability is used). If, for example, total tax revenue collections are $1.5 billion in state A and $7 billion in state B, these amounts do not readily indicate which state has the most revenue available to provide services *to each person*, on the average. But if state A has three million residents while state B has ten million, the taxes-per-capita measure shows state A to have available $500 per person, on the average, while state B has $700. Assuming no difference in cost per unit of service, state B can provide more services than can state A, per average person. Another important difference, however, is the amount of taxable values available, per person on the average. That is, levels of personal income per capita differ among states.

The reason for state A's lower tax collections per capita, in the above example, may be either (a) fewer tax types or lower tax rates are used or (b) less taxable values are available to be taxed. The degree to which a state makes use of the taxable values located in the state–its tax effort–can be measured by expressing state-local tax revenue as a percent of some measure of total economic activity in the state. In the absence of a measure similar to Gross National Product, total personal income is the best and most readily available measure of aggregate economic activity in each state. Consequently, total state-local revenue as a percent of total personal income is widely used as a measure of a state's tax *effort*. (Unfortunately, many readers interpret this as an indicator of the level of tax burdens on families, being essentially a confusion over the meaning and use of "total personal income" in the tax level computations.) For example, states A and B might both collect tax revenue that is 10 percent of total personal income (equal effort) but not necessarily be equal in taxes per capita. If state B had twice the ability (income per capita) as state A, the $700 of taxes per capita in state B would be a lesser effort than state A's $500 taxes per capita.

When used together "taxes per capita" and "taxes as a percent of personal income" give a useful picture of a state's ability to raise tax revenue and the degree to which it is using that ability. These measures should not, however, be used as indicators of tax burdens on families.

What lessons can be learned from this discussion of different measures of tax levels among states? *First*, readers should be alerted to avoid casual acceptance of any statement that Kentucky is either a low-tax or a high-tax state. The particular measurement method used should be compared with the purpose for which the

results are to be used. *Second*, there is a need to compute family tax burdens each year. The two other measures are available each year from U.S. Bureau of the Census publications. This partly explains their wide misuse as indicators of tax burdens. Family tax burdens are not computed each year and therefore appear not to be fully understood. *Third*, there is need for additional study of tax exporting. Not only should we become better informed on Kentucky's tax position and why it occupies that position, but much could be gained from additional knowledge of possible methods for changing Kentucky's tax position. For example, could Kentucky export more of its taxes without suffering undesirable consequences? If possible, taxes per capita could remain unchanged while family tax burdens are reduced.

Footnote

[1] Seung Oh Park and Don M. Soule, *Effects of Business Tax Exporting on Levels of Personal Tax Burdens in Kentucky and Tennessee* (Lexington: Office of Development Services and Business Research, University of Kentucky, 1971). Also see Seung Oh Park, Stephen E. Lile, and Don M. Soule, "Tax Exporting and the Fallacy of Taxes Per Capita as a Measure of Personal Tax Burdens Among States," *Taxes–The Tax Magazine*, Vol. 50 (April 1972), pp. 224-31.

# VI. Energy Factors Affecting the Kentucky Economy

by Charles W. Hultman

One of the more important elements that will continue to have an impact on the Kentucky economy relates to a variety of developments in the field of energy. Perhaps more than any other factor, recent changes in the price and availability of energy will affect the rate of economic growth, the level of employment generated, the composition of industrial output, and various other economic conditions. Only a few years ago, it was possible to assume that the price and availability of fuel would remain relatively constant; at present, it is necessary to focus attention on energy as a crucial resource input, and to take into consideration the adjustments that must be made to the dramatic changes occurring in this area.

The purpose of this paper is to explore a variety of energy-related developments, both at the national and the state level, in an effort to provide a basis for assessing the economic well-being of the state economy for the next decade. Attention is focused on the potential opportunities for the state as a coal producer and the impact this may have on other industries.

## GNP Projections and Energy Usage

Energy requirements for the national economy for coming years will depend to a great extent upon the rate at which Gross National Product (GNP) increases, and also upon the relationship between energy usage and GNP.

Since the amount of energy required will depend upon the volume of goods and services produced, it is necessary to estimate the level of output in the future. A series of GNP projections made by various research units have been summarized in a recent report for the Joint Economic Committee (U.S. Congress). Of the several studies noted in the Committee report, the lowest projected real GNP growth rate for the years 1975 through 1985 was 3.2 percent; the highest, 4.7 percent; the median figure, 4.1 percent. For the latter part of the period (1980-85), the low figure was 2.4 percent; the high, 4.1 percent; the median, 3.5 percent.[1]

The forecasts vary significantly in terms of projection results; in part, this stems from different basic assumptions and estimating techniques. Nevertheless, the range of figures provides a perspective for the consideration of national energy requirements.

*Energy and economic growth.* Energy requirements depend not only upon the rate of growth of GNP, but also upon the relationship between GNP and energy consumption. From an historical perspective (since 1950) the real energy growth rate/GNP growth rate has been about 0.9; that is, for every 1 percent growth in GNP, energy usage has increased 0.9 percent. Thus energy requirements have grown at a slightly lower rate than GNP. The historical ratio of 0.9, however, is significantly higher than the ratio of 0.6 projected under the National Energy Plan (NEP) proposed by the Carter administration in 1977. The NEP reflected a 2.55 percent energy growth rate and a 4.30 percent GNP growth rate through 1985.

Whether the ratio of the energy/GNP growth rates is as low as 0.6 or as high as the historical 0.9 depends upon such factors as the extent of conservation efforts, developments in the field of technology, the price of energy as compared with other inputs, and the composition of aggregate output.

One of the more comprehensive studies of the energy/real Gross Domestic Product (GDP) ratio for recent years was undertaken by Jack Alterman for the Bureau of Economic Analysis. This study explores the long-term downward trend in the Btu/GDP ratio, the reversal of the trend during 1966-70, and the implications of these developments for the future.[2]

Basically, the Btu/GDP ratio reflects the thermal content of energy consumed domestically per dollar of real output of the economy. Empirical evidence reveals that, since 1929, the ratio has shown a general downward pattern, but one marked with both minor and major reversals. The number of Btus per dollar of GDP declined from about 75,000 in the late 1920s to about 58,000 in the mid-1960s. A major reversal occurred during 1966-70 but since then there has been a moderate downward trend. Of major interest is the interpretation of this trend and the nature of the implications it might have for energy conditions in Kentucky during the 1980s.

The Alterman study focuses on three factors affecting the Btu/GDP ratio: changes in population size, in energy prices, and in production. During much of the post World War II period, increased energy consumption was associated with increased population and decreases in real energy prices. However, increases in real output

that were associated with greater civilian employment more than offset the energy response to the population increase and energy price decrease. As a result, there was generally a decline in the Btu/GNP ratio.

Thus in terms of future energy needs, the occurrence of a higher than average increase in worker productivity could offset the energy response to population increases and, in turn, lead to a decline in the Btu/GNP ratio. Further, a Btu/GDP decline would be reinforced by a rise in real energy prices. In fact, increases in real energy costs have occurred in recent years and are likely to lower the Btu/GDP ratio.

Whether or not productivity gains occur to support this development is more problematical; for example, over the period 1966-73, total factor productivity in the U.S. economy as a whole increased by only about 1.7 percent annually. This is less than the historical average and may be reflective of the future trend. However, the consensus reflected in several recent studies undertaken for the Joint Economic Committee was that productivity would grow at a rate somewhere between 1.7 percent and 2.4 percent—about the 1966-73 rate but less than the 1948-66 rate.[3]

In summary, the energy/GDP (or GNP) ratio is likely to decline somewhat in coming years as a result of higher energy prices, although this may be partially offset by an increase in population and a decline in worker productivity. Historically, the growth in energy consumption (in real terms) has not been as great as the growth in GNP. The divergence is likely to become greater in the future. This conclusion is consistent with U.S. Department of Energy projections that suggest an energy/GNP figure ranging from about 0.68 to about 0.88.[4]

## Kentucky Output and Energy Use

A parallel comparison can be made for the state of Kentucky although the available variables are not necessarily equivalent. Table 1 indicates the estimated net Btu consumption of energy in the state for the years 1960-74. Aggregate energy consumption increased from about 550 trillion Btu in the early 1960s to over 800 trillion Btu in the 1970s; also included is gross energy consumption, which increased from 637.9 TBtu in 1960 to 1,173.3 TBtu in 1974.[5] The final column in Table 1 shows Kentucky personal income (in 1976 dollars) for the same period of time. It is apparent in an examination of the data that there is not a close relationship between annual changes in net energy consumption and in personal income. On a long-term basis, the difference is also significant; over the entire period 1960-74, real personal income has increased more than 100 percent while real energy consumption increased only about 50 percent.

The implications of the long-term growth pattern may be significant for future projections. According to one set of figures developed for the Kentucky Council of Economic Advisors, Kentucky personal income in 1976 dollars would increase to about $25.6 billion in 1985 and $30.8 billion in 1990.[6] If net energy consumption were to continue on about the same relationship as that existing within the state in the past, about 1,000 TBtu would be utilized in 1985, rising to almost 1,200 TBtu in 1990. In comparison with the national average, these figures are probably somewhat low and may be the minimum that can be expected. Gross energy consumption has been projected for the Kentucky Department of Energy to increase to 1,569.31 TBtu by 1980—an increase of about 33 percent over 1974 consumption.[7]

TABLE 1

KENTUCKY INCOME AND ENERGY USE
1960-1974

| Year | Btu Energy Use | | Personal Income |
|---|---|---|---|
| | Net | Gross | 1976 Dollars |
| 1960 | 551.3 | 637.9 | 8,906 |
| 1961 | 549.8 | 636.9 | 9,328 |
| 1962 | 573.0 | 680.3 | 9,727 |
| 1963 | 622.1 | 780.2 | 10,068 |
| 1964 | 633.2 | 806.0 | 10,414 |
| 1965 | 643.7 | 833.5 | 11,106 |
| 1966 | 632.1 | 841.2 | 11,829 |
| 1967 | 690.3 | 939.1 | 12,487 |
| 1968 | 725.3 | 957.2 | 13,162 |
| 1969 | 779.1 | 1,047.1 | 13,802 |
| 1970 | 790.3 | 1,189.1 | 14,310 |
| 1971 | 800.4 | 1,180.3 | 14,227 |
| 1972 | 839.3 | 1,250.0 | 15,838 |
| 1973 | 847.4 | 1,201.6 | 16,867 |
| 1974 | 835.2 | 1,173.3 | 17,276 |

SOURCE: U.S. Department of Interior, Bureau of Mines, *Historical Fuels and Energy Consumption Data, 1960-72, United States by States and Census Districts East of the Mississippi*, U.S.G.P.O., 1976; and *Fuel and Energy Data, United States by States and Regions, 1974*, Washington: U.S.G.P.O., 1974.

## Energy Production in Kentucky

In 1974, the latest date for which figures are available, Kentucky's production of basic fuels was as follows:[8]

| | |
|---|---|
| Natural gas | 78.8 TBtu |
| Petroleum | 45.5 TBtu |
| Coal | 3,493.1 TBtu |
| Total | 3,617.4 TBtu |

An estimated 459.1 TBtu of natural gas and petroleum were imported into the state, resulting in 4,076.5 available for internal use. Of this amount, 835.2 TBtu were utilized by the demand sectors as follows:

| | |
|---|---|
| Residential, commercial | 252.3 TBtu |
| Industrial | 294.1 TBtu |
| Transportation | 287.3 TBtu |
| Miscellaneous | 1.5 TBtu |
| Total | 835.2 TBtu |

The difference between the amount available and net usage of final consuming sectors–about 3,241 TBtu–included amounts lost in energy transformation (especially coal to electricity) and coal and electricity exports or sales outside the state.

Kentucky is clearly an important producer, user, and exporter of coal. Given the increasing cost of most forms of energy, and the anticipated decline in availability of natural gas in coming years, the capacity of the Commonwealth to produce and export coal has important implications for overall growth.

*Demand for coal.* Because Kentucky is a major coal producer, one of the more important factors affecting the economic outlook for the Commonwealth as it relates to energy is the national (and foreign) demand for coal. In 1977, Kentucky produced about 142 million tons of coal–above 20 percent of the nation's production.

Several pieces of federal legislation and policy statements in the last few years reflect the desire to make coal a more important type of energy in the foreseeable future. The 1977 National Energy Plan, for example, projected a doubling of coal production to the equivalent of about 1.2 billion tons by 1985. The two basins of which Kentucky is a part would share in this growth; under the National Energy Plan, Central Appalachian coal production (which includes the Eastern Kentucky field) would rise from 184 million short tons in 1974 to 348 million short tons by 1985 and the Midwest (which includes the Western Kentucky field) from 135 to 203 million short tons over the same period.[9]

Whether or not a national production of 1.2 billion tons of coal will be achieved by 1985 remains questionable. A study by the General Accounting Office (GAO), for example, reflects doubt that such a level of production and consumption will be reached by 1985. The GAO study indicates that the production and/or consumption of coal will be constrained by such factors as a strict enforcement of air quality regulations, transportation bottlenecks, labor relations problems, manpower and training requirements, and health and safety regulations.[10]

*Environmental considerations.* One factor affecting the Kentucky coal sector and economy will be various types of legislation designed to protect the environment. Perhaps the most important of these is the Surface Mining Control and Reclamation Act of 1977. Although the overall impact of this Act will not be known for some time, preliminary assessments suggest that the cost resulting from implementation of regulations will be greatest for surface-mined coals of Appalachia. An analysis by the Office of Surface Mines (OSM), U.S. Department of Interior, concludes that the cost will range from a high of $2.16 per ton in the steep contour mining regions of Appalachia to a low of $.02 to $.05 in the North Rocky Mountains and the West.[11]

Although the cost disadvantage to the Appalachian surface mining sector appears to be quite significant, the OSM study concludes that the result would not be one in which a decline in annual production occurred in any district. For Appalachia, the net effect presumably would be to slow the annual growth rate slightly.

*Kentucky coal transport capacity.* During the past few years, there has been both a nationwide and a regional interest and concern regarding the rail transport system and its capacity to haul coal from the mines to the market. For some areas of the country, such as Kentucky, in which coal mining is an important and growing economic activity, uncertainities relating to the shipment of coal from the origin of production to the final destination is of critical concern. This concern centers on several interrelated features of the coal transportation network–the availability of coal hopper cars and locomotives to transport the product, the freight rate applicable to coal, and the use of trucks for haul purposes and the subsequent impact on the highway system.

A significant share of Kentucky's coal is now transported by rail; most is carried by seven lines that service eastern and western Kentucky coal mines. The extent of the coal hopper car and locomotive shortage for a particular region is difficult to quantify and to project for the future. Some sectors of the coal mining industry view a coal car shortage as the major impediment to increased coal sales; however, the rail industry generally feels that, with an adequate rate of return on investment, rail facilities will be adequate to transport the nation's coal.

The Interstate Commerce Commission (ICC) collects statistics on nationwide freight car surpluses and shortages for Class I railroads. The hopper car situation varies significantly from season to season and from year to year. For October and November of 1978, the estimate of the average daily hopper car shortage for the nation ranged from about 8,500 to 10,500.

Recent rate increases granted to railroads on coal freight are of interest because of the impact on coal prices and the ability to compete in the product market.

Because of its bulk, the cost of moving coal has been an important, although declining, portion of the cost to the user. For example, as a share of the destination value of coal, rail rates have declined from about 43 percent in the early 1960s to about 33 percent in 1972. Because of the sharp increase in the price of coal, the ratio declined to about 22 percent in 1975.[12] The Kentucky coal mining industry may be affected by rate increases in two ways: (1) if differentials in rail rate/destination value of coal rates cause a shift in the source of supply of coal and (2) if an increase in the price of coal reduces effective competition with other energy forms.

The growing use of coal has led to a sharp rise in the volume transported by truck with consequent increased deterioration in road beds. At present, over 4,000 miles of Kentucky highway (both state and local) are utilized for haul purposes. In some parts of the state, the costs associated with road damage and traffic inconveniences are extremely high. The present highway system is generally considered to be inadequate to support the requirements that will be placed upon it by an increasing national demand for coal.[13]

*Planned energy production.* Kentucky's competitive advantage in energy production is reflected in planned expansion in both coal mining and electricity generation. A recent survey of states east of the Mississippi River conducted by the U.S. Department of Interior indicates the planned opening of 189 new coal mines of major size with an annual capacity of 246.6 million tons.[14] Of this total, 27 mines with a capacity of 45.7 million tons would be located in Kentucky. The location of these mines—both surface and underground—is shown in Map 1. In 1978, employment in Kentucky coal mining amounted to about 45,000 workers. This number has been projected to increase to about 50,000 in 1980 and 57,000 by 1985.

Also shown on Map 1 is the location of nine new electric generating plants planned for opening in Kentucky through 1984. The Department of Interior survey indicates a planned capacity of 5,033 megawatts for the nine sites. Kentucky is also an exporter of electricity and relies almost completely upon coal as the basic source of fuel for generating purposes.

MAP 1

LOCATION OF PLANNED ENERGY PRODUCTION

SOURCE: U.S. Department of Interior, Bureau of Mines, *Projects to Expand Fuel Sources in Eastern Kentucky*, Washington: U.S.G.P.O., 1978.

Coal conversion to other fuels may also prove to be of some importance to the Kentucky economy. Of the thirteen gasification plants planned for the eastern states, four would be located in Kentucky (Map 1).

## Implications of Energy Price Differentials

The price of energy is important to an economy both in terms of cost of the amounts used by energy consumers and the receipts accruing to energy producers. In addition, price differentials among geographical areas have, and will, affect the composition and degree of growth of such areas.

A recent study prepared by Shirley Burggraf for the White House Conference on National Balanced Growth and Economic Development provides a basis for considering energy developments in terms of price differentials.[15] One of the conclusions of the study is that energy price differentials among states and regions were significant and that this will affect industrial location and economic growth through what might be termed price and income effects.

The Burggraf study uses weighted average prices of Btus paid by electric utilities as a reflection of average costs for a state or region. An indication of price differentials is reflected in Table 2, which shows the average cost per $10^6$ Btu paid in certain states in 1973 and 1976. The cost figures are weighted to represent the particular fuel input mix (coal, natural gas, oil) used in each state. Thus, in 1973, the average cost per $10^6$ Btu ranged from a high of 85 cents in Connecticut to a low of 17 cents in North Dakota. The median price was 46 cents in Georgia; accordingly, the cost of 31 cents in Kentucky was relatively low. In 1976 (a post-embargo year), the price ranged from a high of 230 cents in Vermont to a low of 30 cents in North Dakota; the median price was 103 cents in Alabama, and in Kentucky it was 69 cents. Thus figures from Table 2 suggest that, from a national point of view, the cost of energy in Kentucky (as reflected in electric utility costs) is low enough in relative terms to give the Commonwealth a competitive advantage in a variety of types of activity related to energy production and usage.

*Price and income effects.* Perhaps the most important idea analyzed in the Burggraf study is that the development and growth of a state (or region) will be impacted by both a *price* and an *income* effect. Kentucky is one of a small number of states that would be favorably affected by both developments.

The *price* effect describes the growth in output and economic activity, particularly of an energy-intensive type of industry, where energy costs are relatively low. All other things remaining equal, favorable energy costs give local firms a competitive advantage and thus promote a higher level of income and development for the area.

The *income* effect suggests the potential gains and growth available to a state as a result of energy exports. High energy prices relative to other industrial inputs mean favorable terms of trade in the exchange of goods and services and thus a favorable income transfer for the energy exporting state. This, in turn, provides incentive for market-oriented firms and industry to locate in such a state to take advantage of a growing income and effective purchasing power.

According to Burggraf, the combined income and price effects will play a key role in determining the growth potential of a state. On the basis of these criteria, Kentucky is one of the ten states (along with New Mexico, Wyoming, Montana, North Dakota, Colorado, West Virginia, Utah, Kansas and Louisiana) with the biggest energy advantage for growth.

Insofar as energy cost and availability play a role in economic growth, it is to be expected that Kentucky would experience a higher growth rate in a variety of energy-intensive industries–primary metals, chemicals,

TABLE 2

WEIGHTED AVERAGE ENERGY PRICES PAID BY ELECTRIC UTILITIES FOR SELECTED STATES

| | Average Cost in Cents Per $10^6$ Btu | | | |
|---|---|---|---|---|
| | 1973 | | 1976 | |
| High-cost state | 85.29 | Connecticut | 230.40 | Vermont |
| Median-cost state | 45.63 | Georgia | 103.04 | Alabama |
| Kentucky cost | 30.74 | (42nd) | 69.05 | (38th) |
| Low-cost state | 16.74 | North Dakota | 29.54 | North Dakota |

SOURCE: Compiled from Shirley P. Burggraf, "Energy: The New Economic Development Wildcard" (Paper prepared for the White House Conference on National Balanced Growth and Economic Development), Washington: U.S.G.P.O., January 1978.

and allied products, and paper and allied products. It would also include the market-oriented firms and industries that may develop because of the growth in income and effective money demand in the area.

## Energy Requirements and Normative Goals

A high rate of economic growth has long been considered a major national goal. However, in recent years, social dislocations and environmental degradation have led some to argue for a "no-growth" policy. One result of this controversy is that the rate of economic growth and, accordingly, the rate of increase in energy usage, are no longer simply accepted in a positive framework or as an analysis of what is likely to occur. Instead, the rate of growth of GNP and energy usage are increasingly considered in normative terms or in terms of what ought to be.

The normative approach to resource use was probably enhanced with the Carter administration's proposal that the consumption of energy be limited to an annual growth rate of 2 percent per year. The proposal foresees a larger increase in the use of coal and electricity, with the consumption of natural gas and petroleum held as low as feasible.

The decision to establish or prescribe such national goals as the rate of economic growth alters somewhat the approach developed to examine energy requirements. If the desired rate of GNP becomes a given, then the task becomes one of determining what rate or rates of growth in energy production are required to sustain that level of GNP growth.

In practice, energy requirements and accordingly energy projections for future years must involve both normative and positive elements. While energy usage will continue to reflect decisions based on the free market forces of demand, supply, and prices, there will also be efforts to conserve on its consumption, either through voluntary efforts or through government imposed restrictions (e.g., the Powerplant and Industrial Fuel Use Act).

## Summary and Conclusions

As a consumer and major producer of energy, the Kentucky economy is affected by a variety of complex but interrelated factors and developments involving the price and availability of energy. In relative terms, energy requirements are not expected to be as great in that both the future growth rate of GNP and the relationship between energy consumption and GNP will probably be lower in the future. Although the nationwide demand for energy products can be expected to increase at a lower rate as output becomes less energy-intensive, increased emphasis will be placed on the use of coal, at least in the short and medium terms, because of the relatively abundant supply of reserves. Thus economic growth opportunities in the state will be enhanced in connection with increased coal production. However, the strict enforcement of environmental standards may somewhat reduce the competitive advantage of the Kentucky coal industry, especially because of the existence of steep-contour mining areas in Appalachia. The transportation of coal from the mines to the ultimate consumer also poses problems that have yet to be resolved.

However, in terms of promotion of economic growth, the state economy can expect to gain as a result of increased income and employment opportunities, and an expanded tax base. Specific industries that are likely to be affected include coal mining and related industries, energy-intensive industries, and certain consumer and market-oriented firms that locate in areas of rising income and employment.

### Footnotes

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[14]This figure does not include hundreds of small mines that may open and close over the same period of time. See U.S. Department of Interior, Bureau of Mines, *Projects to Expand Fuel Sources in Eastern States* (IC 8765), Washington: U.S.G.P.O., 1978.

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# ANNUAL REPORT-1980

# Council of Economic Advisors

Commonwealth of Kentucky
John Y. Brown Jr., Governor

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University of Kentucky
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(606) 258-4626

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## THE KENTUCKY COUNCIL OF ECONOMIC ADVISORS

The Kentucky Council of Economic Advisors was created by Executive Order in December 1970, and was confirmed by the legislature in Chapter 147B, Kentucky Revised Statutes in the 1972 regular session. Its functions are as follows:

1. To collect, compile, and interpret economic data concerning the economy of the Commonwealth (including employment, unemployment, wages, personal income, profits and other socioeconomic information).
2. To make economic projections and recommendations.
3. To report to the Governor at the beginning of each fiscal year and calendar year on the state of the economy of the Commonwealth.
4. To undertake such other related tasks as may be requested by the Governor.

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The KCEA publishes each of its reports as a contribution to the competent professional treatment of the subject. Its studies are undertaken in an objective fashion and, accordingly, worthy of public consideration. The interpretations and conclusions in such publications are those of the authors, and do not necessarily reflect the views of the Council, its members, or any other organization or person.

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Charles G. Renfro
Executive Director
Kentucky Council of Economic Advisors

# PREFACE

Economic issues remain of critical importance as the state and national economies move into the decade of the 1980s. The petroleum shortage, inflation and increasing unemployment are among the major current problems that will require the attention of policy makers in the months and years ahead.

Successful resolution of economic problems requires full knowledge and information of basic conditions that affect the structure of production, exchange, and consumption activities. As part of the effort to perform its legislative function to collect and interpret economic data on the economy of the Commonwealth, the staff of the Kentucky Council of Economic Advisors presents this *Annual Report 1980.*

The *Report* assesses developments in the U.S. and in Kentucky during the 1970s and early in 1980 and provides projections of employment, income and other key economic variables through the fourth quarter of 1981. Other sections of the *Report* summarize the nature of conditions existing in each of the area development districts, and in Lexington and Louisville, the state's two major urban areas. The outlook for the coal industry and for the agricultural sector are also provided. Although the economic situation in mid-1980 is clothed in uncertainty, it is believed that the material contained in this ninth annual report will provide a basis for a better understanding of both existing and expected conditions in the Commonwealth.

The Council and staff would like to take this opportunity to thank the many people throughout Kentucky who have taken the time, this past year, to review and comment on many KCEA draft reports and to offer advice and support concerning KCEA activities: Lawrence K. Lynch, Transylvania University and former Executive Director of the KCEA; Ronald Morgan and Ann Peel, Kentucky Department of Commerce: Thomas Griswold, Damon Harrison, and Margaret Lebus, Kentucky Department of Energy; Robert Morgan, Bureau of Computer Services, Kentucky Department of Finance; Robert MacDonald, Kentucky Department for Human Resources; Eddie Sayre and Gary Long, Kentucky Department of Labor; Richard Sims of the Legislative Research Commission; Joe McNeal, Kentucky Department of Local Government; Rose Marie Clements, C. Frank Harscher, and Jeff Kell, Kentucky Department of Natural Resources and Environmental Protection; Paul Tanner and Richard Thalheimer, Kentucky Department of Revenue; Christopher Maddocks and James Nelson, Kentucky Department of Transportation; James Brockway, Urban Studies Center, University of Louisville; and Darrell Gilliam, Blue Grass Area Development District.

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Charles W. Hultman
Chairman
Kentucky Council of Economic Advisors

# I. The National Economic Situation

by Charles Renfro

On the 14th of March the Carter Administration announced an anti-inflation policy package that if fully implemented and pursued with vigor promises to insure an election year recession. The monetary policies of the past six months, as they have tightened, have raised interest rates to record levels. Now, in addition, credit controls have been imposed that not only increase the costs of providing credit, but involve some degree of direct rationing. The provisions are sufficiently vague, with the detailed implementation left to the discretion of banks and other lenders, that it is difficult to assess fully their likely impact, but these controls may have an effect immediately as well as in the longer term. The immediate effect may take the form of more cautious consumer behavior, reflecting not only the perceived difficulty of obtaining new credit, but also the threat of a change in the required amortization rate on current indebtedness.

Complementing this augmented monetary policy is a revised Administration budget that is ostensibly more anti-inflationary than the initial budget of six weeks before. Currently, fiscal policy must be regarded as being mildly stimulative, involving a deficit at all relevant levels of economic activity. In contrast, the new proposed budget replaces the estimated $16 billion deficit for fiscal 1981 in January's budget with a projected surplus of $10 billion–at least in the absence of a recession. The new budget achieves this swing of $26 billion with three provisions. It proposes a spending cut of $13 billion together with a $3 billion revenue increase in the form of a withholding tax on dividends and interest and a further $10 billion revenue increase in the form of a $4.62 per barrel "gasoline conservation" fee on imported crude petroleum; this conservation fee is essentially the equivalent of a 10 cent tax per gallon at the pump.[1]

It is possible to view the policies just outlined as being recessionary both in nature and in intent. Even prior to their announcement and partial implementation, the economy was widely believed to be on the verge of an overdue recession. Given this view of the economy's likely performance in 1980, these policies could be regarded as serving only to administer a somewhat belated coup de grace.

However, alternatively, it is possible to view the Administration's willingness to consider policies that may be recessionary in impact as reflecting the continued strength of the economy during 1979 and so far this year. Notwithstanding an inflation rate that is measured by the Consumer Price Index as being nearly 20 percent, the economy has yet to show unambiguous signs of a coming pervasive weakness. The tight monetary policies of the past six months have lead to a substantial decline in the rate of housing starts. The inability of the domestic automobile industry to produce a sufficient quantity of the type of automobile now demanded by the consumer has contributed to a sharp decline in the rate of automobile sales. However, at least so far, residential construction and domestic automobile sales represent exceptional cases rather than the rule. In general, the economy continues to expand and the unemployment rate continues to hover about the 6 percent mark, as it has for the past year.

Another interpretation of the new policies is that they will help to check inflationary expectations and thus reduce the inflation interest rate premium required by lenders. The economy's strength has not only served to steel the apparent resolve of policy makers, it has caused some economists to postulate that the economy may be entering a dangerous phase in which unchecked inflationary expectations could lead to consumer and business behavior that tends to foster a hyperinflation. It is easy to see in an inflation rate of nearly 20 percent a situation that could get out-of-control, especially if this number is taken at face value and if it is assumed that inflation reflects the effect of too much money chasing too few goods; this interpretation suggests as a policy prescription a strong anti-inflationary posture, if not a recession.

Evidently, different people hold different views concerning the state of the economy. Some people still regard a soft landing as possible, given appropriate economic policies–and a little bit of luck. Others have been confidently predicting recession next quarter each quarter during the past year. Associated with this diversity of opinion are different views as to what policies should be pursued to at least reduce the rate of inflation, if not simultaneously avoid a recession. Coordinated fiscal and monetary policies require the agreement of the White House, the Congress and the

Federal Reserve Board, so that forecasting the performance of the economy in this climate of opinion involves predicting political reactions to the current economic news just as much as it does predicting the impact of particular economic policies.

This chapter expands on this introductory discussion and attempts to provide both a statement of the present condition of the economy and an assessment of the economic outlook during the next two years. In the first part of the chapter, the economy's behavior in 1979 is reviewed in order to define the state of the economy at the beginning of 1980. The second part provides an assessment of the economic outlook for 1980 and 1981.

## The U.S. Economy in 1979

At the beginning of 1979, it was possible to see the clouds of recession roiling and threatening, for it seemed evident that the economy's rate of growth would decline in comparison to that for either of the previous two years. In both 1977 and 1978, the economy had grown in excess of its trend rate of growth, so that a third year of such performance would have been unusual in any case, especially as the spring of 1979 would mark the beginning of the fifth year of recovery since the severe 1974-75 recession. However, by January 1979, the economy was operating at or near its capacity limits and the acceleration in price inflation during 1978 promised stringent monetary and fiscal policies. A more restrictive fiscal policy stance seemed inevitable, in part because it would require little or no initiative. In the absence of legislative action, inflation in wages and salaries would tend to increase the percentage tax yield, despite the tax cut bill scheduled to go into effect on the first of the year.[2] In addition, the increased social security contributions that were to be required in 1979 would subtract from discretionary income. More restrictive monetary policies would have a further depressive effect on the economy's performance, but also seemed likely to be adopted, if only to steady the dollar.

It appeared, therefore, that the economy's average rate of growth would decline in comparison with that of the previous two years, and it was possible that it would decline sharply. The Shah had been overthrown in Iran, and a significant reduction in worldwide oil production could occur, with a resulting increase in world petroleum prices. It was true also that in the first quarter, the consumer seemed likely to purchase cautiously. However, there were reasons to expect the recovery to continue. Unless the consumer actually reduced the volume of his purchases, growth would certainly continue; the outlook was also favorable for an increase in both business fixed investment expenditures and in exports. Housing starts might weaken slightly in comparison with the previous year, but there was a strong inherent demand for housing, and particularly because of recent changes in financial arrangements, financial institutions were still substantially able to fund the construction and purchase of houses. Otherwise, businessmen seemed eager to purchase plant and equipment; the same capacity limits that would constrain growth in 1979 would also act as a spur to business investment expenditures. As for exports, they provided strong year-end support in 1978 and seemed likely to continue to grow in volume in early 1979, possibly rapidly.

Nevertheless, the high rate of inflation, a weak dollar, and a variety of other danger signals made optimistic economists a relatively rare species in early 1979. The fourth quarter of 1978 had shown signs of being a period of excess, as often precedes the onset of recession. The rate of consumer expenditure in this quarter was, if anything, surprisingly high. Furthermore, the composition of those expenditures was heavily weighted towards consumer durable purchases, and at least some of these purchases—possibly even many of them—appeared to represent consumer buying in anticipation of future price rises. The consumer had sustained the recovery since its beginning in the spring of 1975, with the construction of houses and other structures weak initially, foreign trade and the dollar soft more recently, and businessmen noticeably cautious throughout.[3] Consequently, the fourth quarter consumer splurge could be read as a signal that the economy was poised on the verge of recession.[4]

The news, in April, that real GNP had increased at the rate of only 0.7 percent in the first quarter of 1979 confirmed for some economic forecasters that the year would be a recession year, especially as this meager growth followed 6.9 percent growth in the last quarter of 1978. Actually, both these figures have since been revised by the U.S. Department of Commerce, to 1.1 and 5.6 percent respectively, so that the decrease in the economy's rate of growth between the fourth quarter of 1978 and the first quarter of 1979 was less than appeared in the spring of 1979.[5] However, the difference is only a matter of degree; the economy obviously exhibited weak growth in the first quarter of the year whichever set of figures is considered. As a result, it took only the subsequent July report that real GNP had actually declined at a rate of 3.3 percent in the second quarter of the year to cause a general rush to judgement that a recession had begun.

In the late spring of 1979, it was easy to make a case in favor of the proposition that the recession had begun or would begin shortly. Even in advance of the report of the second quarter decline, there were indications of a possible decline. In the fourth quarter of 1978, as a corollary of the consumer expenditure surge, the percentage of disposable personal income not

spent—the savings rate—fell to an abnormally low 4.3 percent. During the first quarter of 1979, it appeared that the rate of growth of real consumer expenditures had decreased, and that the savings rate had risen. One of the possible reasons was that the consumer might have been in the process of retrenching. During the 1978 automobile purchasing boom he had accumulated record amounts of installment debt so that weakness in consumer expenditures was understandable. However, at this time, there was apparently also an increased rate of business inventory accumulation and stronger demand for raw materials; this seeming strength could be interpreted as business commitment, but alternatively it could be interpreted as a reaction to supply uncertainties and other unsettling conditions. Added to these conditions were a restrictive monetary policy stance by the Federal Reserve Board and increasing fiscal policy conservatism in the wake of Proposition 13.

It is now known that 1979 would not be a recessionary year; however, the belief to the contrary persisted for the rest of the year, notwithstanding subsequent events. Since July 1979, the GNP data for the second quarter have been revised. The rate of decline in that quarter is now estimated to have been 2.3 percent, rather than 3.3. In addition, it was reported in October 1979 that in the third quarter the economy resumed its growth at a rate now estimated to be 3.1 percent.[6] This third quarter growth was more than sufficient to compensate for the second quarter decline. Furthermore, the economy grew in the fourth quarter at a rate of 2.0 percent. In fact, it now appears that this rate of growth was sustained even through the first quarter of 1980.

Actually, the evidence available during 1979 on the economy's performance never justified the description of the economy as being in recession. In the first place, a recession is not defined as simply two or more consecutive quarters of decline in real GNP, as is often supposed. The National Bureau of Economic Research (NBER), the organization generally accepted by economists as being responsible for identifying U.S. economic recessions, takes into account more than just the change in real GNP. NBER examines a number of measures, "including employment, unemployment, output, income and sales, and considers how long sustained the decline is, how deep it gets, and how widespread are its effects in comparison with previously recognized recessions."[7] All recognized recessions since 1948 have lasted at least nine months—or the equivalent of three quarters—and during each of these recessions, unemployment rose by at least two percentage points.[8] Furthermore, real GNP decreased by at least 1.5 percent in absolute terms and by as much as 5.7 percent; in contrast, the decline in real GNP in the second quarter of 1979 was an absolute percentage decrease of only 0.58 percent. An additional characteristic of each of the post-war recessions has been employment declines in 80 to 90 percent of the major U.S. industries.[9] Consequently, it is not surprising that on July 26, after the first report of the real GNP second quarter decline, the NBER Committee on Business Cycle Dating met and concluded there was insufficient evidence to warrant labeling 1979 a recessionary year, beginning in the second quarter.[10]

As reported in the July 23, 1979 KCEA *Economic Situation Report*, it was evident then that the second quarter decline was fundamentally a consequence of the spring gasoline shortage and price rise, and of the effect of this price rise and shortage on motor vehicle purchases and use during that quarter.[11] A salient characteristic of the decline was a decrease of $6.9 billion in the real consumer motor vehicle purchases component of GNP, which more than offset the increase of $1.5 billion in other real consumer durable purchases, for a total consumer durables purchases decline of $5.4 billion. Among nondurable consumer purchases, real food purchases declined by $0.5 billion and real gas and oil purchases by $3.0 billion. However, real consumer expenditures for services increased by $2.6 billion, although there was a $1.4 billion decline in the electric and gas subcomponent, reflecting spring weather conditions.

Otherwise, it is relevant that there was a roughly $1 billion decrease in real U.S. exports—on a National Income and Product Accounts basis—and a substantial rise in real business inventories of $5.8 billion. But, of the rise in inventories, the preponderance represented increased stocks of motor vehicles. During this quarter, nonagricultural employment increased steadily and the unemployment rate fell from 5.8 percent in April to 5.6 percent in June. The subsequent growth of the economy during each of the three quarters since, together with an unemployment rate of about 5.8 percent throughout the remainder of 1979, provides yet further evidence of the aberrant nature of the second quarter behavior of the economy.

However, in order to properly characterize 1979, in preparation for an examination of the economic outlook for 1980 and 1981, it is necessary to consider the more detailed aspects of the economy's performance in this year. While residential construction continued to show unexpected strength into the fourth quarter, despite tightening monetary policies that raised the prime rate to nearly 16 percent and mortgage rates to a fairly common 13 or 14 percent, by the end of 1979 these policy measures were having an effect. Housing starts were falling and had fallen from a rate of more than 1.7 million units in October to less than 1.5 million units in December. Similarly, while the consumer continued to buy, savings as a percent of disposable income dwindled to less than 4 percent; the Bureau of Economic

Analysis most recently reports a savings rate of only 3.5 percent during the fourth quarter of 1979.

## Prices

During the mid to late 1970s, the rate of inflation continued to be high compared to both the 1960s and the 1950s. However, even in this context, 1979 marks the beginning of a reacceleration in prices, reflecting particularly an increase in the prices of various forms of energy and higher costs associated with house purchases. During the first three quarters of the year, combined energy product prices increased at an annual rate of more than 40 percent, a direct result of large increases in the price of electricity, fuel oil, gasoline and natural gas: the fuel oil and gasoline price increases were, of course, primarily a result of the situation in Iran and attendant higher world crude petroleum prices. The surge in homeownership costs was a consequence of the robust demand for houses, a sustained increase in the purchase prices of houses, and higher mortgage interest rates. Higher interest rates were also the consequence of tightening monetary conditions, especially since the institution of the new Federal Reserve Board monetary policies in October 1979.

However, while late in 1979 energy prices and homeownership costs were the principal causes of the rapid rate of increase in the Consumer Price Index, from 9 percent annually in 1978 to nearly 13 percent at annual rate during the last three quarters of 1979, their inflationary role was comparatively less evident earlier in the year. At the beginning of 1979, food prices captured the spotlight. During 1978, consumer food prices increased at an average rate of nearly 12 percent, but in the first five months of 1979, these increases accelerated to a rate of 14.5 percent. This accelerated increase reflected weather conditions and strikes, which hindered the harvest and hampered the distribution of foodstuffs in late 1978 and early 1979. It also reflected a 12 percent increase in beef prices in the first half of 1979, which followed the nearly 30 percent increase in 1978. These price increases were the result of lean inventories of cattle on farms, and the consequent shortage of beef, but they were also due to some shortages in competitive meats, particularly chicken and pork.

The memory of the food price rises in early 1979 has been largely effaced and part of the reason is that during the year supplies of chicken and pork increased, putting downward competitive pressures on beef prices. Beginning in June, for this and other reasons, there was a sudden lull in food price increases. Food and beverage price increases averaged only 0.1 percent in June and July, and were actually unchanged in August. In fact, the grocery store subcategory index of the Consumer Price Index actually declined in some months during the second half of the year. Unfortunately, these declines were not sustained, and although compared to 1978, 1979 exhibited less food price inflation, in the late part of this year food prices exceeded those one year earlier by nearly 10 percent. Were it not for increases in excess of 17 percent in the transportation category of the Consumer Price Index, of more than 13 percent in the housing category and nearly 10 percent in medical care, the food price increase would attract more attention.

The figures just cited all represent category subindices of the Consumer Price Index. These have been referenced, in part, because the CPI is the best known, most widely used measure of inflation. Changes in the CPI are reported monthly by the media for the United States as a whole and, in the past, there have been separate CPIs constructed for individual states.[12] Nationally, the CPI is widely used not only as a basis to increment wages in order to compensate for increases in the "cost-of-living," but also to index civil service and military retirement payments and to adjust social security payments. In addition, it is used in the food stamp program and has been employed as a criterion for the distribution of manpower revenue sharing funds, as well as for a number of other similar purposes.[13]

The CPI is important as a measure of inflation, but these uses of the index illustrate that it is also important for its effect on the income of Americans: a 0.1 percent increase in the CPI has been estimated by the Bureau of Labor Statistics to have an effect of over $100 million on U.S. aggregate personal income.[14] The CPI is therefore, in addition, a potential cause of further price inflation through its effect on wages, labor costs, income, and thus on consumer demand.

This index is not, however, the only measure of inflation; for example, it is not used in order to determine real personal income, nor to compute real personal consumption expenditures. The index used is the Personal Consumption Expenditures Deflator. This distinction is especially important for 1979 because of the fact that this year the CPI and the Consumption Expenditures Deflator diverged in their measurement of the degree of inflation. While the CPI suggests that during the first three quarters of 1979, consumer prices increased at the annual rate of almost 13 percent, the Consumption Expenditures Deflator implies a rate of increase of just over 10 percent. Moreover, the Gross National Product Deflator, which measures the price increases associated with *all* newly produced final goods and services in the United States economy, increased by only 8.8 percent at annual rate over these quarters. All these measures show an acceleration in the rate of price inflation, but the Personal Consumption Expenditures and Gross National Product Deflators each show significantly less acceleration between 1978 and 1979 than does the Consumer Price Index; Table 1

TABLE 1

COMPARISON OF MEASURES OF INFLATION
(Percent Change)

| Item | 1978 | 1979 |
|---|---|---|
| Consumer Price Index[1] | 7.7 | 11.3 |
| Personal Consumption Expenditures Deflator[2] | 6.8 | 8.9 |
| Gross National Product Deflator[2] | 7.3 | 8.8 |

SOURCE: [1]Consumer Price Index for All Urban Consumers (CPI-U). Bureau of Labor Statistics, *News: The Consumer Price Index–December 1979* (Washington, D.C.: Bureau of Labor Statistics, January 25, 1980).
[2]*Survey of Current Business*, March 1980, Table 27.

compares the acceleration in these indices.

One of the reasons why the CPI and the Personal Consumption Expenditures Deflator differ is that they measure the composition of a consumer market basket at two different times. The Consumer Price Index measures price changes in terms of a historical market basket that refers to the 1972-73 period.[15] In contrast, the Personal Consumption Expenditures Deflator measures price changes in terms of a *current* market basket of goods and services. It should be noted, however, that in measuring the cost of living, it is not obvious which market basket represents the best choice, for although there is an obvious defect in measuring price changes in terms of the CPI, using a market basket consumers *used* to buy, the reason that people have changed their buying patterns may be because they can no longer afford to buy compositionally what they used to buy.[16]

Another important difference between the two measures of consumer price changes is that the Consumer Price Index measures the cost of housing in terms of what is, in fact, only an occasional purchase on the part of any given household. Housing was one of the components of the Consumer Price Index that, in 1979, primarily caused the accelerated change in this index; the specific subcomponents were home purchase prices and contracted mortgage interest costs. However, particular households do not buy a house every month or even every year. During any short interval of time, only a small proportion of households–approximately one of fifteen–will buy a house. Yet housing has a significant weight–23 percent–in the computation of the Consumer Price Index relative to other purchase categories.

There are actually two problems associated with the housing component of the Consumer Price Index during periods of rising house prices and mortgage interest rates. The first is that the construction of the index implicitly assumes the average consumer to be a prospective house buyer at any point in time.[17] The second problem is that this index does not take into account that for an existing homeowner, a rise in the price of his house represents an increase in the value of his assets, not an increase in the cost of living. In contrast, the Consumption Expenditures Deflator measures homeownership costs in terms of both imputed and actual net rental costs, balancing the appreciated rental value of a house against the increased cost of its operation due, for example, to increases in energy prices.

## Personal Consumption Expenditures

The precise way in which the rate of consumer price inflation is measured is important to the analysis of the economy's behavior for two reasons in particular. The first is that in order to be able to distinguish the real, or volume, part of any change in consumption expenditures from that part that is simply the result of higher prices, it is necessary to know the rate of inflation. Current dollar personal consumption expenditures generally increase from quarter-to-quarter, even if the volume of purchases has declined, and this type of divergence is particularly likely to occur during periods of rapid price increases. However, the rate of inflation also affects the ability of the consumer to purchase, and this ability is usually considered in terms of changes in real disposable income. As mentioned earlier, it is conventional to deflate both income and expenditures using the same price index. Thus, the second reason that knowledge of the rate of consumer price inflation is important is in order to be able to compare the ability to purchase with the volume of purchases over time.

The consumer's willingness to purchase in 1979 relative to earlier years is indicated by the figures in Table 2, which shows the annual rate of change in the various major categories of real personal consumption expenditures. It is immediately obvious that, overall, the consumer reduced the rate of increase in his purchases in 1979, compared to the immediately preceding three years. However, upon closer inspection, it is clear also that this result is in part due to outright decreases in the volume of purchases in certain specific categories–motor vehicles and parts, gasoline and oil, and fuel oil and coal–and a small percentage increase in the volume of food purchases. The decrease in automobile purchases is not that surprising, following as it does three years of increased sales of automobiles. The decreased purchases of gasoline and oil may reflect a combination of the increased energy efficiency of automobiles driven in the United States and more conservative driving habits. Similarly, the decrease in the use of fuel oil and coal may also reflect both conservation attempts and increased efficiency in the use of fossil fuels, particularly

TABLE 2

U.S. PERSONAL CONSUMPTION EXPENDITURES IN CONSTANT DOLLARS
ANNUAL RATES OF GROWTH–PERCENT

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Personal Consumption Expenditures | 1.82 | 5.94 | 5.01 | 4.54 | 2.63 |
| Durable Goods | 0.18 | 12.33 | 9.16 | 6.15 | 0.27 |
| Motor Vehicles | 0.90 | 21.65 | 10.46 | 4.15 | -6.54 |
| Furniture and Household Equipment | -1.58 | 6.41 | 7.91 | 5.24 | 4.81 |
| Other Durable Goods | 3.45 | 5.56 | 9.47 | 13.94 | 6.75 |
| Nondurable Goods | 0.89 | 4.86 | 3.48 | 3.19 | 1.69 |
| Food | 2.43 | 5.54 | 4.13 | 0.36 | 1.08 |
| Clothing and Shoes | 3.89 | 5.05 | 4.50 | 7.86 | 5.22 |
| Gasoline and Oil | 1.63 | 4.00 | 3.08 | 4.48 | -4.64 |
| Fuel Oil and Coal | 0.00 | 9.62 | -3.51 | 0.00 | -5.45 |
| Other Nondurable Goods | -5.22 | 2.83 | 1.84 | 5.26 | 2.57 |
| Services | 3.19 | 4.84 | 4.91 | 5.12 | 4.26 |
| Housing | 4.21 | 4.66 | 5.79 | 5.82 | 5.84 |
| Household Operation | 4.56 | 4.37 | 5.89 | 5.21 | 4.44 |
| Electric and Gas | 5.58 | 2.88 | 5.14 | 3.11 | 3.45 |
| Other | 3.86 | 5.41 | 6.09 | 6.95 | 5.08 |
| Transportation | 0.70 | 2.79 | 3.39 | 6.56 | 4.92 |
| Other Services | 2.36 | 5.56 | 4.11 | 4.19 | 2.66 |

SOURCE: National Income and Product Account Tables, *Survey of Current Business;* Kentucky Economic Information System, U.S. Annual Bank.

oil.

The significance of the figures shown in Table 2 is not the decreased rate of consumer purchases in 1979, but also that the decreases occurred in those categories of expenditures most subject to price increases, or else–as in the case of motor vehicles–that are used with commodities particularly subject to price increases. If should be noted in addition that the decreased real expenditures on motor vehicles reflects not just a reduction in the number of automobiles sold, but also the poundage of automobiles sold. A changing size mix in the automobiles bought, namely the substitution of small cars for large cars, tends to show up in the real motor vehicle expenditures data as a decrease in the amount purchased.

The overall increase in the amount of consumer purchases, even if by a smaller percentage in 1978, provided the principal support for the economy's continued growth in 1979, notwithstanding the "hiccup" in the second quarter of the year. For this reason, it is important to consider not just the overall rate of increase in real consumer expenditures, but also the rates of increase by category. However, in considering these expenditures, it is important to attempt to determine as well the degree to which the consumer's purchases were instigated by price increases. One of the explanations sometimes given for the continued growth in the economy in 1979 is that the consumer was in some sense "panicked" into buying in anticipation of future price increases.

The consumer's motivation is a critical issue in the assessment of the economic outlook. A significant overall reduction in consumer expenditures for any reason will result in a substantial decline in the level of economic activity, reflecting the fact that many business decisions are keyed to the behavior of consumer expenditures, as well as that consumer expenditures are the largest single component of Gross National Product, in real terms accounting for approximately 65 percent of GNP in 1979. The hypothesis that the consumer has overextended himself, taking on an unprecedented amount of debt in order to purchase against future price rises, simultaneously implies the possibility of a very serious recession when it comes.

Actually, as shown by the figures in Table 2, the consumer appears to have behaved quite sensibly in 1979. Not only did he respond to accelerated price increases in particular categories of goods and services by reducing the quantity purchased, or at least only marginally increasing the amounts purchased, but there is no evidence of any significant acceleration in the quantity purchased of any category. The evidence is of a slower overall rate of increase of consumer purchases in the face of a higher rate of inflation and, late in the year, tighter monetary policies.

It is true, nevertheless, that during 1979, the

consumer seemed willing to purchase notwithstanding a decreasing ability to purchase. The ratio of saving to disposable personal income decreased during the year to reach a low of 3.5 percent in the fourth quarter. As pointed out earlier, this is an abnormally low level for the savings rate. During the preceding ten years, this rate has averaged approximately 6.7 percent annually, and during the 1970 to 1975 period it generally stayed in the range from 7.3 to 7.5 percent.[18] However, in 1976, it fell to 5.7 percent; in 1977, to 5.1 percent; in 1978, to 4.9; and, in 1979, it averaged 4.5 for the year. Apparently, the consumer has been saving proportionately less of his income progressively for the past five years. Surely this indicates some degree of profligacy? It is also true that during the past four years, in real terms, durable goods expenditures have been about 10 percent of GNP; this is higher than the 7.5 percent generally observed at the comparable stage of earlier post-war economic recoveries.

However, for perspective, it needs to be recognized that certain social and demographic changes have also occurred. During the past few years, there has been a proportionately larger number of younger households, reflecting the population bulge in the 25 to 35 age group. There is a larger number of single and two person households, for whom savings may be less important.[19] However, even in the case of households with children, this is precisely the age group that, as households, can be expected to spend in excess of current earnings, and therefore to undertake installment debt. These households also can be expected to spend a relatively higher proportion of their incomes on consumer durables. In addition, there are various other, institutional, reasons why the savings rate would be expected to have decreased; for example, the federal tax changes in the 1970s have tended to provide relief for low and middle income consumers, who might have a propensity to spend a significant proportion of the increase in after tax income on consumer durables.[20]

There is no question but that during the past two years, at least, there has been some degree of hedge buying on the part of the consumer. There is evidence of this from the consumer expenditure surveys undertaken during this time.[21] However, on balance, the savings rate and the higher proportionate expenditures on consumer durables observed recently do not indicate a fundamental change in the behavior of the individual consumer; he has not been panicked into seriously overextending himself in order to buy. What is also interesting, as shown by the pie charts in Figure 1, is the composition of consumer purchases in 1979 as compared to the composition in 1972. The demographic changes that have occurred explain certain aspects of recent consumer expenditure behavior. In addition, notwithstanding a high rate of inflation, the economy itself has been performing sufficiently well to give the consumer some confidence in the future. Not only has there been steady year-to-year growth since 1976, but employment has been at record levels, and the unemployment rate continued to stay in the neighborhood of 6 percent even into 1980.

## Residential Construction

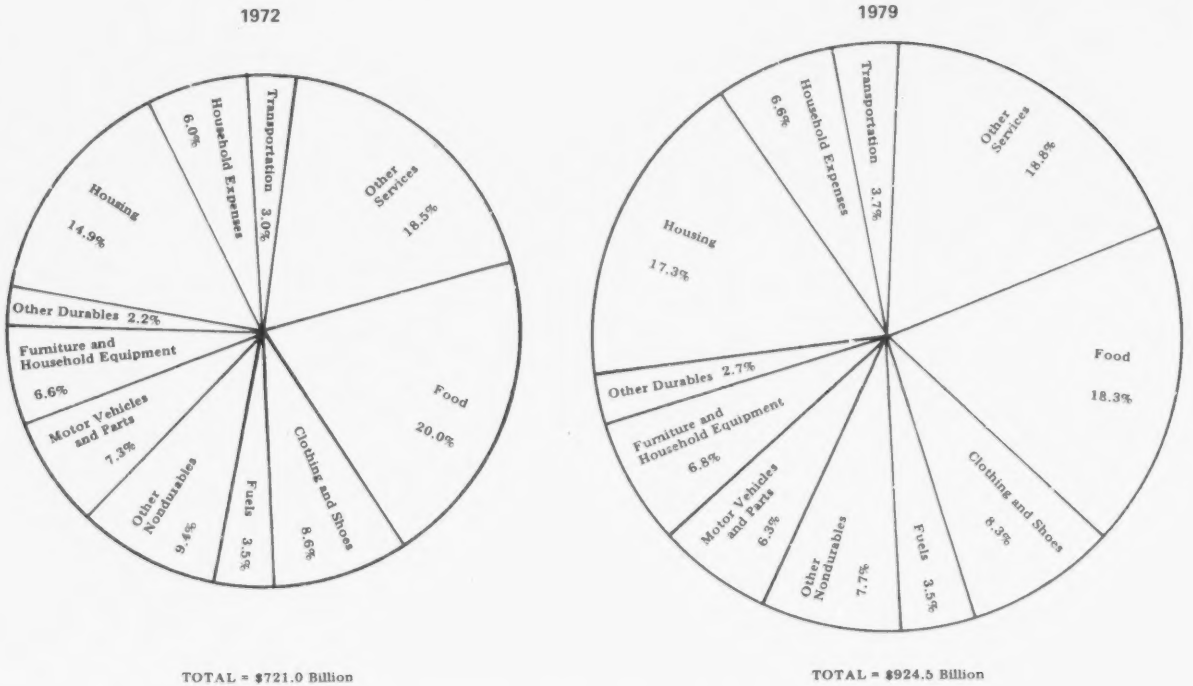
There is, however, one type of expenditure that has been strongly influenced by inflation psychology, namely house purchases. As a consequence of the growing scarcity of mortgage funds and interest rates that were climbing towards the mid-teens, house prices began to soften at the end of 1979 and the rate of purchases to slow, but even into the fourth quarter the demand for houses remained strong. As noted earlier, it was only in October that housing starts began to decline significantly from rates of 1.8 million units per year.

The purchase of a house is commonly thought of as a type of consumer expenditure, particularly as houses tend to be bought by consumers. However, in the present context it is treated as belonging to a separate category of expenditures, reflecting that to the extent it is included in the National Income and Product Accounts, it is recorded as a component of business investment, not as a consumer expenditure. This accounting convention carries with it important implications that need to be considered briefly.

In the context of the National Income and Product Accounts, the sale of an existing house is regarded simply as the transfer of an asset between individual economic agents. Because this transfer does not represent the production of a new good or service, it is excluded from the Accounts, apart from any realtor's commission. In contrast, the purchase of a newly built house is included, except for the value of the land. However, as it is the construction of the house—rather than its purchase—that is emphasized in the Accounts, the value of the house is counted as a component of business investment expenditures.

An important consequence of this accounting convention is that, as an activity, house buying does not result in a decline in the savings rate, because it does not appear in the accounts as a consumer expenditure.[22] Only indirectly, as a stimulus to the purchase of household appliances and fixtures subsequently, could house buying have the effect of reducing this ratio. In fact, considering more philosophically the issue of the purchase of a house in anticipation of future price rises, it is an important characteristic of this purchase that what is bought is something that is normally regarded as an appreciating asset, not as an item to be consumed. As assets, a house and a refrigerator, for example, have

FIGURE 1. DISTRIBUTION OF REAL PERSONAL CONSUMPTION EXPENDITURES IN 1972 AND 1979
(Billions of 1972 Dollars)




SOURCE: National Income and Product Accounts Tables, *Survey of Current Business*, March 1980.

rather different economic characteristics.

Reflecting both increased construction costs and tighter credit conditions, the rate of housing starts was generally lower throughout 1979 than in either 1977 or 1978. Nevertheless, during the seven months of the year beginning in March, single-family starts exceeded the rate of 1.2 million units annually. This rate is below the average of more than 1.4 million units achieved in both 1977 and 1978, but it is only slightly below the peak rates reached during the last housing construction boom in 1972. Multi-family starts also exhibited strength during the same period, with construction proceeding at rates close to those of 1977 and 1978. As in 1978, some of this building was the result of the operation of the HUD Section 8 subsidized rental units program; however in 1979, rental vacancy rates were also generally at historically low levels.

There are several reasons why residential construction was sustained even into the waning months of the year. These include the continued high rates of sales of houses and the increased prices of houses, each of which circumstances provided stimulus for builders. However, as in 1978, the demand for houses in 1979 also reflected two conditions in particular. First, the belief on the part of many would-be purchasers that a house historically represents one of the best consumer investments. Secondly, the general expectation that house prices would continue to increase, possibly at a rapid rate.

Sustaining this demand have been certain innovations in the mortgage market. In the past, home building tended to be "crowded out" in the advanced stages of an economic recovery: because of fixed legal interest rate ceilings, savings and loans and other mortgage lenders used to be limited in their ability to compete for funds with banks and other institutions. As interest rates began to rise, reflecting a growing general demand for funds on the part of the consumer, business, and government, the result was a rapid outflow of funds from thrift institutions, and a consequent shortage of money for mortgages.

However, since June 1978, mortgage institutions have been allowed to issue money market certificates yielding interest rates pegged to Treasury Bill rates, thus permitting them to maintain deposit inflows despite high interest rates. More generally, during the past few years, with the development of mortgage-backed pass-through securities, the mortgage market has been better integrated into the more traditional capital markets; in effect, these securities allow increased mortgage lending by commercial banks and government-linked lenders.[2 3] As a consequence of these changes, thrift institutions' net mortgage holdings fell much less in both 1978 and 1979 than would have occurred otherwise, and house purchases and housing starts were sustained at high levels longer.

Nevertheless, the tighter monetary policies implemented by the Federal Reserve Board on October 6 had an almost immediate effect on the market for mortgage funds. Mortgage institutions were faced with higher costs to attract new funds, in the form of interest rates that were substantially in excess of the effective rate generated by their outstanding loan portfolios. Some institutions stopped making new mortgage commitments. Others raised their required down payment percentages or took other steps to tighten lending provisions. As a consequence, during the fourth quarter of the year, mortgage rates rose sharply, setting the stage for slower sales of existing houses and a reduction in the rate of housing starts.

## Nonresidential Business Investment

Business investment expenditures include not only residential construction, but also nonresidential business fixed investment and inventory investment. These two categories of business expenditures are best considered in the context of the past five years, for it is characteristic of the period since the beginning of the recovery in the spring of 1975 that businessmen have been cautious in their investment behavior. Only during the past two years or so have real expenditures for plant and durable equipment exceeded the peak level previously reached in 1973. With the exception of these years, fixed nonresidential investment has been weighted towards short-lived assets, rather than expenditures for structures and other longer-lived assets. Throughout the period, an increase in inventories in one quarter has tended to be followed by a quarter of inventory reduction measures.

After the spring of 1975, investment expenditures were slow to respond to the increased expenditures of consumers and the recovery, and to some degree this was to be expected. Spending for plant and durable equipment generally follows in a recovery, rather than leading it, for the reason that at a recession trough there is usually considerable excess capacity. As a consequence, it is normal for there to be a period of weak demand for investment goods. However, it is also usual, once the recovery has shown itself to be firmly established, for businessmen to begin to undertake some investment in anticipation of the future.

There is little evidence in the investment behavior of the past five years to suggest that anticipation has been a very strong motivating force. Throughout the period, inventory accumulation has been kept firmly in check, with inventory-sales ratios remaining low by historical standards. As suggested earlier, in the few instances that this ratio tended to rise, the bulge in inventories was not allowed to remain longer than one or two quarters. Similarly, expenditures for plant and equipment have not been noticeably responsive either to accommodating

monetary policies or to increasing profits. Nor have they been very responsive to evidence of strong consumer demand.

The behavior of real expenditures for nonresidential structures and for producers' durable equipment is shown in Table 3. It is evident from this table that there was less growth in total nonresidential fixed investment in 1979 over 1978, but it is also clear that it was not until 1977 that the rate of growth in this total exceeded 8 percent. Note also that it was only in 1978 that there was a sizable increase in real investment in structures. Furthermore, during the 1976 through 1978 period, the highest growth rates were recorded for expenditures on automobiles, trucks and buses; this was also the only category of nonresidential real fixed investment expenditures to decrease in 1979.

However, in considering these figures, it is important to note that if the carrot of anticipation proved to be ineffective, through 1979 at least, the stick also did not have a dramatic effect. Beginning in 1978, monetary policy began to become restrictive, but the coincident slowing in the rate of increase in total nonresidential fixed investment expenditures was considerably less than a percentage point, a decrease from 8.66 to 8.35 percent. Moreover, not only did interest rates rise during 1978, there were increases in equity dividend-price ratios, and a slowing in the rate of increase in real final sales, from 4.8 in 1977 to 4.3 in 1978. However, the effect of these unfavorable developments seems to have been offset by an upward movement in the rates of capacity utilization. During this recovery, the need for capacity, not anticipation, has motivated capital spending.

The compositional change in investment expenditures between 1978 and earlier years is additional evidence of the cautious frame of mind of businessmen. Table 3 shows that in 1978 there was a noticeable shift towards expenditures for long-lasting items in preference to the shorter-lived. Beginning in 1978, there was a seeming shift away from motor vehicles towards other types of durable equipment and, in particular, towards structures.

## Foreign Trade

Exports represent another source of demand for goods and services produced in the United States. In 1979, both in current dollar and real terms, exports increased at a faster rate than imports, leading to a decrease in the trade deficit and an increase in the volume of net exports, and thereby sponsoring part of the increase in real GNP. The behavior of exports and imports was the result of several circumstances, especially the increased competitiveness of U.S. exports due to the 1978 dollar depreciation, the maintenance of growth rates on the part of major U.S. trading partners, and the decline in the U.S. rate of growth from 4.4 percent in 1978 to 2.3 percent in 1979. The price competitiveness of U.S.-produced goods and services and the sustained growth of other economies helped to cause the increased level of exports. The slowing growth rate in the United States helped to restrain the increase in imports.

The major portion of the increased volume of merchandise exports was in the form of nonagricultural exports, which increased by more than 10 percent. Apparently, there were increases in all the major commodity categories, but the greatest strength was in intermediate and investment goods.[24] As in 1978, the strength in investment goods purchases was in machinery purchases, both electrical and nonelectrical and in commercial aircraft. However, there was also an increase in the volume of agricultural exports, of at least 4 percent, a substantial part of which was due to shipments to the Soviet Union and other Eastern European countries.

In current dollar terms, a large proportion of the increase in merchandise imports represented purchase of crude petroleum, but, in volume terms, there was little change in petroleum imports from 1978. Furthermore, petroleum imports as a proportion of domestic

TABLE 3

NONRESIDENTIAL REAL BUSINESS FIXED INVESTMENT EXPENDITURES
(Percent Change)

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Total Nonresidential | -13.02 | 4.75 | 8.66 | 8.35 | 6.2 |
| Structures | -12.71 | 3.23 | 2.09 | 12.28 | 9.57 |
| Producers' Durable Equipment | -13.17 | 5.49 | 11.65 | 6.77 | 4.68 |
| Autos, Buses and Trucks | -18.09 | 26.99 | 20.77 | 10.40 | -8.70 |
| Other | -11.73 | -0.33 | 8.50 | 5.38 | 10.06 |

SOURCE: National Income and Product Accounts Tables, *Survey of Current Business;* Kentucky Economic Information System.

consumption remained below the 1977 peak. Automobiles and consumer goods accounted for some of the decline in the volume of imports; however, once automotive imports from Canada are excluded, there was a substantial increase in this type of import, following a more than 45 percent increase in 1978. While there was a 10 percent decline in sales of domestically produced automobiles in 1979, sales of imported automobiles increased by more than 15 percent.

In addition to these merchandise trade developments, there was a substantial net increase in international service transactions. Following increases of 13 and 18 percent in 1977 and 1978 respectively, there was a 37 percent increase in net service receipts in 1979. Most of this surplus represents earnings on direct investments, particularly in the form of increased receipts from affiliates of U.S. oil companies. However, an increase in the number of foreign visitors also had some impact, reducing the net travel and passenger fares by almost $600 million.

In general, the dollar remained fairly stable against other currencies during 1979. However, there were certain exceptions to this rule, such as the dollar's more than 20 percent appreciation against the yen, and its nearly 10 percent depreciation against the pound sterling. Part of the dollar's general stability over the year was the result of its relative strengthening subsequent to the Federal Reserve Board's policy announcement of October 6, 1979. During the previous summer, there was downward pressure on the dollar in response to U.S. inflation rates and rising commodity prices, including gold and silver.

This export performance of the United States economy in 1979 can be attributed to earlier developments, as well as the particular circumstances during the year. Specifically, the price competitiveness of U.S. goods and services currently is the result of the devaluation of the dollar relative to other currencies in earlier years. Furthermore, during the period from about 1977 through 1979, the relative performance of other major industrial economies improved, compared to that of the U.S. economy, thus leading to increased U.S. exports. The export-import performance of the U.S. economy in earlier years has been described in some detail elsewhere.[25]

## Government

Government purchases of goods and services is the remaining category of aggregate national demand. Considering first total expenditures and receipts, on a National Income and Product Accounts basis, the federal government was in deficit in 1979. However, as shown in Tables 4 and 5, while this year the federal deficit was $11.2 billion, the combined surplus of state and local governments was $24.7, resulting in a total government surplus of $13.5 billion. Seen in this light, government was not stimulative in its fiscal policies in 1979. In contrast, in 1978, the federal deficit was $27.7 billion and the state and local surplus was $27.4 billion, for a total government deficit of $0.3 billion.

As far as goods and services purchases only are concerned, in 1979 total government expenditures grew by 9.4 percent; however, this is a rate of growth of only 0.4 percent in real terms. Federal government purchases of goods and services increased by 9.2 percent in current dollar terms and 0.9 percent in real. State and local government purchases increased by 9.5 percent in current dollars and only 0.2 percent in 1972 dollars. The percentage change in real goods and services purchases measures the direct government contribution to the economy's growth.

It is interesting that while total government expenditures in 1979 increased by nearly 10 percent, government receipts increased by nearly 12 percent. Federal government expenditures increased by 10.7 percent, but its receipts increased by 15.2 percent. State and local government expenditures increased by 8.7 percent and receipts by 7.1. Thus, notwithstanding that the federal government remained in deficit in 1979, it was the

TABLE 4

FEDERAL GOVERNMENT RECEIPTS AND EXPENDITURES
(Billions of Dollars)

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Surplus or Deficit (-), National Income and Product Accounts | -70.6 | -53.6 | -46.3 | -27.7 | -11.2 |
| Social Insurance Funds | -12.7 | -11.7 | -9.9 | -1.4 | 2.7 |
| Other Funds | -57.8 | -41.8 | -36.5 | -26.3 | -14.1 |

SOURCE: National Income and Product Accounts Tables, *Survey of Current Business;* Kentucky Economic Information System.

TABLE 5

STATE AND LOCAL GOVERNMENT RECEIPTS AND EXPENDITURES
(Billions of Dollars)

| | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|
| Surplus or Deficit (-), National Income and Product Accounts | 6.2 | 17.9 | 26.8 | 27.4 | 24.7 |
| Social Insurance Funds | 12.5 | 15.7 | 19.6 | 23.2 | 26.6 |
| Other Funds | -6.2 | 2.3 | 7.3 | 4.2 | -1.9 |

SOURCE: National Income and Product Accounts Tables, *Survey of Current Business;* Kentucky Economic Information System.

federal government, rather than the state and local governments, that assumed a more restraining fiscal policy position compared to 1978.

## Employment, Unemployment and Productivity

Corresponding to the 2.3 percent growth in real GNP during 1979, total employment increased by 2.7 percent. This employment growth represents the addition of 2.57 million people to the work force and one of the consequences was a decline in the average unemployment rate from 6.0 percent in 1978 to 5.8 percent in 1979. In 1979, 59.3 percent of the noninstitutional U.S. population, 16 years of age and older was employed.

There were increases in most major employment categories. The greatest percentage increase was in white collar workers, an increase of 4.5 percent, compared to a 1.7 percent increase in blue collar workers. The number of service workers was essentially unchanged, but there was a decline of 3.4 percent in farm workers. Within the white collar category, the greatest increase was in professional and technical workers, 5.7 percent, and among clerical workers, 4.2 percent. Managers and administrators increased by 4.1 percent and salesworkers by 3.6 percent. As in 1978, women were disproportionately represented in the employment increase, with a percentage increase of 4 percent, compared to an increase of only 1.8 percent for men.

However, a particular feature of the past five years is not only that significant increases in employment have occurred, even in the past year, but that there was a relatively early decline in labor productivity. It is characteristic of the waning stages of a recovery that the increase in output per man-hour diminishes noticeably, reflecting labor market conditions and capacity constraints that begin to be encountered. But in the current recovery, this decline in the growth rate of productivity occurred much earlier.

Various explanations have been advanced to explain this decline.[26] It has been argued that the increased participation rates of women and young workers implies a work force that, on average, is less experienced than in past years. Since 1970, new work safety and environmental protection regulations have been imposed. These regulations have had a direct impact, but their being in force has also had an effect on capital spending. A significant proportion of business investment expenditures during the past ten years appears to have been on plant and equipment mandated by these regulations. Furthermore, it is possible to argue that the increased cost of energy has resulted in a shift towards more labor-intensive production techniques, thus tending to decrease output per man-hour.

Since increases in productivity help to offset increases in the cost of production and, thus, help to moderate the effects of "cost-push" inflation, the lower rates of productivity increase during the past few years, particularly, have been inflationary consequences. The inflation experienced in 1979 was largely due to oil price increases and other such circumstances, but at the very least the combination of tightening labor markets, particularly for skilled workers, and low productivity growth have helped to sustain increased cost pressures.

## The Economic Outlook 1980-81

The question of whether or not, of its own accord, the economy would go into recession early in 1980 is now moot. Prior to March 14, the economy continued to grow and only in the case of certain industries, such as the automobile manufacturing industry and construction, were there any unmistakable signs of decline. However, with the announcement of new monetary and fiscal policies on March 14th, there has been a major change in the economic environment.

In terms of their immediate effect on the economy, the most important of the policies announced are the monetary policies.[27] These include: a request on the part of the Federal Reserve Board that commercial

banks limit the growth of loans to the range of 6 to 9 percent; the establishment of 15 percent noninterest bearing "special deposit requirements" for credit card, check overdraft, and certain other types of lenders of consumer credit; imposing a 15 percent special deposit requirement on money-market mutual fund asset increases; and the addition of a 3 percentage-point surcharge on the 13 percent discount rate in the case of banks that borrow frequently at the Federal Reserve Board's discount window. The other provisions include a rise in the 8 percent reserve requirement for certain managed liabilities of FRB member banks and other institutions to 10 percent; the imposition of a 10 percent requirement on the same managed liabilities of nonmember banks; the lowering of the base for the calculation of the reserve requirement for banks; and the establishment of a ceiling on interest rates paid by bank holding companies on certain debt instruments.

Some of these changes were made under the provisions of the 1969 Credit Control Act, as authorized by President Carter. The President authorized the Federal Reserve Board to restrict consumer credit growth, to limit the growth of money market funds, and to impose the 10 percent reserve requirement on nonmember banks. The Federal Reserve Board made the other changes on its own authority. However, the overall effect will be to limit the amount of new loans that can be made. A secondary effect will be to raise interest rates.

The apparent aim of the new monetary policies is to allocate credit in a way that would differ from the allocation that would occur otherwise. The intention seems to be to restrict consumer lending, to discourage lending for corporate take-overs, to limit growth of corporate lines of credit supporting corporate commercial paper, prevent financing of speculative holdings of commodities, and yet to make funds available for small businesses, farmers and home buyers. In the absence of the new policies, according to the Federal Reserve Board, an effect of its restricting the growth of bank reserves would be simply to raise interest rates to the point that only certain (large) borrowers would be able to borrow.

In contrast, the fiscal policies will take effect at the earliest on May 15. The principal fiscal policy initiatives are the levy of a $4.62 per barrel gasoline conservation fee and the newly proposed surplus federal government budget. The other measures announced include more intensive wage and price monitoring, certain taxes on diesel fuel, state-by-state gasoline conservation targets, and an appeal to Congress to enact legislation fostering saving and increases in productivity. Of these, the most definite is the gasoline conservation fee, scheduled, on the President's authority, to take effect May 15, 1980.

The policies announced on March 14 have been reviewed in some detail partially to illustrate their complexity. It seems evident that these policies, particularly the monetary policies, are likely to create a considerable amount of confusion initially. The Federal Reserve Board has consciously framed its new policies so as to leave the decisions as to the specific impacts of the policies to individual lenders. Thus it may take some time for businesses and consumers to determine how the policies will affect them individually; this is an important consideration, for uncertainty on the part of businesses and consumers may result in an immediate and possibly substantial decrease in the rate of business activity and consumer purchases.

Consumers are now faced with the possibility of annual fees on credit cards that have not previously imposed such fees; they may be liable for larger monthly repayment amounts for existing debt. Even if, objectively speaking, the new credit policies were to be neutral for the average consumer, because of the uncertainty their implementation involves, there is likely to be an immediate depressive effect on consumer purchases. At the very least, the new policies are likely to be interpreted by consumers as implying a reduction in their ability to obtain funds, should the need arise. This alone will tend to cause the consumer to behave more cautiously.

Similarly, businesses producing products characteristically bought on credit—which include not only "large ticket" items, but also many other purchases—are likely to anticipate a decline in the rate of purchases as a result of the credit restrictions. The net result may be, even initially, an increase in furloughs and layoffs. In the case of such businesses as automobile manufacturers, it is patently obvious that the effect of the credit restrictions will be to reduce sales, and hence production in anticipation of those lost sales.

In an election year, the initial effect of the new policies may in fact be as important as the ultimate effect. Indeed, if the just-imposed monetary policy measures have the effect of reducing economic activity immediately and by a significant amount, at least some of the fiscal policies may never be implemented. Thus, in considering the new policies, it is important to take account of the earliest time at which each of the provisions could be implemented. Furthermore, these policies cannot be considered as a single package. In interpreting the effect of the policies, it is necessary to gauge the marginal effect of each of them as they are progressively implemented, bearing in mind that 1980 is an election year.

## National Control Forecast 1980-81

In order to assess the economic outlook in the light of the policies announced on March 14, a national

forecast has been made using the Wharton Mark IV Quarterly Econometric Model of the United States, developed by the Wharton Econometric Forecasting Associates. However, this forecast has been made by the author, not by the Wharton Associates. It will be referred to simply as the *National Control Forecast.*

The principal assumption that stands behind this forecast is that the monetary policies, as outlined, will be implemented–for the most part they already have been. However, of the fiscal policy provisions, only two have been incorporated as forecast assumptions. It is assumed that the gasoline conservation fee will be imposed as of May 15, 1980. It is further assumed that there will be a reduction of approximately $1 billion in grants-in-aid to states, including revenue sharing and various welfare programs, in line with the new budget proposal. In contrast, the new budget proposal itself calls for a reduction in these grants-in-aid and other disbursements of more than $3 billion. Essentially, the fiscal policy assumptions of the forecast incorporate a budget that includes some of the provisions of both the budget as originally proposed in January and the new budget just announced.

However, in making the forecast, an attempt has been made to assess the reactions on the part of the Administration, Congress, and the Federal Reserve Board to the quarter-by-quarter results, particularly in 1980. Thus, for example, the decline in the level of economic activity in the second quarter, as predicted, is assumed to result in a moderating reaction on the part of the government.

The forecast is presented in annual summary form in Table 6 and in quarterly detail in Appendix Table A-1. The forecast is for a decline in real GNP (and business activity generally) in the second quarter of 1980, but not a full recession. The monetary policies of March 14 are viewed as having an almost immediate impact, with the prime rate peaking at about 20 percent in May. However, the credit restrictions are seen as having the effect of depressing consumer demand for consumer durables and causing housing starts to fall to an annual rate of just over 1.1 million units annually during the second quarter. In this quarter, the unemployment rate is projected to reach 7.2 percent, but the Consumer Price Index falls to just over 14 percent from 17.6 percent in the first quarter.

In this forecast, some of the rise in interest rates, particularly the prime rate, can be regarded as being due to overreaction on the part of businessmen concerned to secure lines of credit in an uncertain environment. Some of the lines of credit secured will not be used and consequently, the third quarter involves a drop in the prime rate to levels approaching 12 percent. Simultaneously, with a precipitate drop in mortgage rates,

**TABLE 6**

**NATIONAL CONTROL FORECAST**
**ANNUAL SUMMARY TABLE**
**SELECTED ECONOMIC INDICATORS**

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Gross National Product (Billions $) | 2369.4 | 2601.5 | 2857.9 |
| % Chg.: Gross National Product | 11.36 | 9.79 | 9.86 |
| Real Gross National Product (Billions 1972 $) | 1431.7 | 1442.2 | 1463.3 |
| % Chg.: Real Gross National Product | 2.32 | 0.73 | 1.46 |
| Implicit GNP Deflator | 165.5 | 180.4 | 195.3 |
| % Chg.: Implicit GNP Deflator | 8.84 | 9.00 | 8.26 |
| Personal Income (Billions $) | 1923.7 | 2137.4 | 2377.3 |
| Total Civilian Employment (Millions) | 96.95 | 97.25 | 99.39 |
| Civilian Labor Force (Millions) | 102.91 | 104.40 | 106.29 |
| U.S. Population (Millions) | 220.6 | 222.4 | 224.4 |
| Unemployment Rate (%) | 5.79 | 6.85 | 6.50 |
| 90 Day Treasury Bill Rate (%) | 10.07 | 11.11 | 8.17 |
| Federal Funds Rate (%) | 11.19 | 13.47 | 8.62 |
| Bank Prime Loan Rate (%) | 12.67 | 14.56 | 10.09 |
| Moody's Total Corporate Bond Rate (%) | 10.03 | 11.84 | 9.39 |
| Federal Surplus (+) or Deficit (-) (Billions $) | -11.00 | -24.45 | -11.88 |

Forecast Date: March 15, 1980.

there is some rebound in this quarter in housing starts, to a level in excess of 1.4 million units, at annual rate. There is also some growth in real GNP during this quarter, but it is not until the end of the year that the peak level reached in the first quarter is reattained.

This is a consciously optimistic forecast and assumes that the consumer, after having reduced purchases in the second quarter and thus increasing the savings rate to almost 5 percent, will nevertheless be willing in subsequent quarters to increase his purchases of automobiles and other items for which some degree of debt financing is involved. In fact, the gasoline conservation fee levied by President Carter can be expected to have some effect towards stimulating the purchases of gasoline efficient automobiles, since it will have the effect of significantly raising the operating costs of older, less gasoline efficient vehicles. The immediate effect of the new monetary policies will be to tend to reduce purchases of all automobiles, but if the credit restraint restrictions are lifted late in the second quarter or early in the third, it is possible that automobile purchases will increase, rebounding in the third quarter from the decline in the second.

The forecast essentially asserts the inherent strength of the economy at this time and characterizes the second quarter decline in economic activity as being the direct result of the monetary and fiscal policies implemented since the beginning of October 1979. The forecast also embodies an assumption about economic policy that once the effects of the policies now in force become apparent, there will be some swing towards more permissive monetary policies. The forecast further assumes that the ostensibly very high rates of inflation experienced in the first two or three months of the year will naturally moderate during the next quarter, falling to a level near 10 percent, as measured by the Consumer Price Index. The moderation of inflation, combined with an increasing unemployment rate and manifest signs of weakness in such activities as house construction and automobile purchasing, will serve as a stimulus to Congress and the Administration, if not the Federal Reserve Board, to pursue more accommodating economic policies. Partially because direct credit restriction has not been practiced as a policy in the United States for many years, the psychological effect of these policies may have been underestimated by both the Administration and the Federal Reserve Board. The resumption of growth in the third quarter follows to some degree from an assumed lifting of those Federal Reserve Board credit restriction policies that were authorized by President Carter under the 1969 Credit Restriction Act.

## Alternative Forecast: Wharton Forecast of January 28, 1980

The Wharton forecast of January 28, 1980 refers to the *Pre-Meeting Control Forecast* made on that date by the Wharton Econometric Forecasting Associates using the Wharton Mark V Quarterly Model of the United States. The table of selected indicators for this forecast is shown in annual summary form in Table 7 and in quarterly detail in Appendix Table A-2. This forecast was obviously made prior to the March 14 economic policy announcement and is included now for two reasons in particular. The first is that it provides a forecast against which to compare the National Control Forecast, as described above, and the post-announcement Wharton March 28 forecast, described below. The second reason is that it is the basis for the Kentucky alternative forecast described in the next chapter that updates the February 15, 1980 Kentucky forecast presented in the winter issue of *Kentucky Economy: Review and Perspective*, published prior to the March 14 announcement.[28]

This Wharton forecast assumes continued tight monetary policies and no tax cut in 1980. The resulting forecast is for a decline in real GNP during the first two quarters of 1980, after which there is a resumption of economic growth, but at very low rates. Real GNP is expected to decrease by approximately 1.0 percent during the first two quarters of 1980, and to grow by 1.3 percent during the next four quarters. During this period, federal defense expenditures are projected to represent the principal area of rapid growth. The unemployment rate is predicted to rise progressively during 1980, and to reach the level of 7.5 percent in the fourth quarter. Throughout the 1980-81 forecast period, short-term interest rates are shown as declining gradually. Long-term rates are shown as peaking in the first quarter, then declining very gradually.

## Alternative Forecast: Effect of March 14 Economic Policies

An alternative view of the effect of the economic policies announced on March 14 by the Carter Administration is provided by a forecast made on March 28 by the Wharton Econometric Forecasting Associates using the Wharton Mark V Quarterly Econometric Model of the United States. The table of selected indicators for this forecast is shown in annual summary form in Table 8 and in quarterly detail in Appendix Table A-3. This Wharton forecast is the national basis upon which the Kentucky Quarterly Econometric Model forecast of March 30 is made; this Kentucky forecast is described in Chapter II.[29]

This Wharton forecast is similar to the National Control Forecast inasmuch as it is also made on the assumption that not all the economic policies announced on March 14 will be implemented. The Wharton Econometric Forecasting Associates assume that the monetary

TABLE 7

WHARTON QUARTERLY ECONOMETRIC MODEL
ANNUAL SUMMARY TABLE
SELECTED MAJOR ECONOMIC INDICATORS

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Gross National Product (Billions $) | 2368.5 | 2576.5 | 2829.9 |
| Percent Change | 11.33 | 8.78 | 9.83 |
| Real Gross National Product (Billions 1972 $) | 1431.1 | 1430.9 | 1452.1 |
| Percent Change | 2.28 | -0.02 | 1.49 |
| Implicit Price Deflator | 165.5 | 180.1 | 194.9 |
| Percent Change | 8.88 | 8.81 | 8.21 |
| Percent Change Consumer Price Index | 11.41 | 11.98 | 9.24 |
| Percent Change Wholesale Price Index | 12.48 | 13.74 | 9.58 |
| Personal Income (Billions $) | 1923.0 | 2118.8 | 2326.4 |
| Total Civilian Employment (Millions) | 96.97 | 97.83 | 98.55 |
| Non-Ag. Wage & Salary Employment (Millions) | 93.68 | 94.64 | 95.46 |
| Manufacturing | 21.00 | 20.52 | 20.40 |
| Durable Goods | 12.71 | 12.28 | 12.23 |
| Nondurable Goods | 8.29 | 8.24 | 8.17 |
| Total Civilian Labor Force (Millions) | 102.93 | 105.10 | 106.79 |
| Total U.S. Population (Millions) | 220.5 | 222.4 | 224.4 |
| Federal Reserve Board Industrial Production Index | 152.1 | 151.4 | 153.8 |
| Percent Change | 4.1 | -0.5 | 1.6 |
| Unemployment Rate (Percent) | 5.79 | 6.91 | 7.71 |
| Net Exports (Billions 1972 $) | 17.7 | 23.6 | 26.8 |
| Money Supply–$M_1$ (Billions $) | 371.0 | 394.1 | 413.1 |
| Percent Change | 5.15 | 6.22 | 4.84 |
| Corporate Profits Before Tax (Billions $) | 237.1 | 225.6 | 214.0 |

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: January 28, 1980.

policies will be implemented as announced. However, they assume that the proposal to withhold taxes on interest and dividends will not be enacted. Furthermore, they incorporate only a minimal cutback in federal purchases and grants. They argue that, in addition to the problem of effecting spending cuts in an election year, high inflation rates will tend to increase the costs of many federal government programs, making a net reduction of the magnitude of the March 14 proposals very difficult. But they do assume that the oil conservation fee will be imposed, notwithstanding some opposition in Congress. The most important differences between the assumptions of this Wharton forecast and the National Control Forecast presented earlier are that the Wharton forecast assumes a maintenance of credit controls and high interest rates for a much longer period of time–into 1981–and that the credit controls imposed by the Federal Reserve Board will have psychological and other effects that are not large.[30]

Based upon these assumptions, the Wharton forecast is for a recession beginning in the second quarter of 1980 and continuing for the next two quarters. Real GNP is predicted to decline from peak to trough by 0.9 percent and the recovery in 1981 is expected to be "very gradual," with an increase in real GNP of only 1.9 percent during the four quarters between the fourth quarter of 1980 and the fourth quarter of 1981. The forecast suggests that inflation should be reduced over the forecast period, with the Consumer Price Index predicted to rise by 10.2 percent in 1981, less than the 13.6 percent increase predicted for 1980. However, the unemployment rate of this forecast continuously rises throughout 1980 and 1981, rising to almost 7.9 percent in the fourth quarter of 1981; in 1980, it averages 6.8 percent and in 1981, 7.8 for the year, as shown in Table 8.

TABLE 8

WHARTON QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: EFFECT OF
POLICIES ANNOUNCED MARCH 14, 1980
ANNUAL SUMMARY TABLE

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Gross National Product (Billions $) | 2368.8 | 2592.1 | 2849.2 |
| Percent Change | 11.34 | 9.42 | 9.92 |
| Real Gross National Product (Billions 1972 $) | 1431.6 | 1436.9 | 1447.3 |
| Percent Change | 2.32 | 0.37 | 0.72 |
| Implicit Price Deflator | 165.5 | 180.4 | 196.8 |
| Percent Change | 8.85 | 9.04 | 9.11 |
| Percent Change Consumer Price Index | 11.47 | 13.58 | 10.18 |
| Percent Change Wholesale Price Index | 12.48 | 17.04 | 12.66 |
| Personal Income (Billions $) | 1924.2 | 2133.0 | 2343.5 |
| Total Civilian Employment (Millions) | 96.95 | 98.08 | 98.63 |
| Non-Ag. Wage & Salary Employment (Millions) | 93.65 | 94.86 | 95.48 |
| Manufacturing | 20.98 | 20.64 | 20.36 |
| Durable Goods | 12.70 | 12.42 | 12.16 |
| Nondurable Goods | 8.28 | 8.22 | 8.20 |
| Total Civilian Labor Force (Millions) | 102.91 | 105.24 | 106.93 |
| Total U.S. Population (Millions) | 220.5 | 222.4 | 224.4 |
| Federal Reserve Board Industrial Production Index | 152.1 | 151.8 | 152.3 |
| Percent Change | 4.1 | -0.2 | 0.3 |
| Unemployment Rate (Percent) | 5.79 | 6.79 | 7.77 |
| Net Exports (Billions 1972 $) | 17.6 | 21.1 | 20.4 |
| Money Supply–$M_1$ (Billions $) | 371.0 | 389.7 | 406.4 |
| Percent Change | 5.15 | 5.05 | 4.27 |
| Corporate Profits Before Tax (Billions $) | 237.4 | 242.1 | 241.8 |

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: March 28, 1980.

The principal interest rate predictions of this Wharton forecast are shown in Table 9. It will be noted that, from the second quarter of 1980, these rates are higher than the rates of the National Forecast shown in Table 6 and in Appendix Table A-1. An important consequence of this interest rate scenario is that the Wharton forecast also predicts housing starts of 1.12 million units for 1980 and 1.39 million units for 1981. In addition, this forecast incorporates a decline of 4.7 percent in real consumer durable expenditures in 1980 over 1979. Real consumer expenditures for new automobiles are predicted to decrease by 13 percent in 1980 and 4.1 percent in 1981.

This Wharton forecast provides a contrast to the National Control Forecast presented earlier, but it is also possible to question its realism. A prime rate that averages 17.7 percent for 1980 and only falls to 14.2 percent in 1981, by its implications, should have more of an impact on the U.S. economy than just a three quarter recession. It is not surprising that the Wharton forecast would include a substantial decline in new automobile sales in both 1980 and 1981 with these prime rates. What is surprising is that the economy, by this forecast, begins to recover in 1981. The forecast implies rather significant institutional changes in consumer credit provisions (including usury interest rate ceilings in a number of states) if the economy is to recover notwithstanding its interest rate predictions. It implies substantial political pressures for relief of the residential construction industry, not only from builders but also from those wishing to purchase and rent new dwellings.

Considerations such as these and the recognition that 1980 is, after all, an election year, suggest that once the effects of the monetary policies implemented just after March 14 begin to be felt, there is going to

TABLE 9

THE WHARTON QUARTERLY MODEL
ALTERNATIVE FORECAST: EFFECT OF POLICIES ANNOUNCED MARCH 14, 1980
INTEREST RATE PREDICTIONS

| | Quarterly Forecasts | | | | | | | | Annual | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Item | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 | 1982 |
| 90 Day Treasury Bill Rate | 13.60 | 16.88 | 15.26 | 12.92 | 12.27 | 12.11 | 11.75 | 11.06 | 10.07 | 14.66 | 11.80 | 10.73 |
| Federal Funds Rate | 15.45 | 18.62 | 17.17 | 15.05 | 13.74 | 13.42 | 12.98 | 12.36 | 11.19 | 16.57 | 13.13 | 11.94 |
| Bank Prime Loan Rate | 16.61 | 20.09 | 18.53 | 15.71 | 14.79 | 14.46 | 14.05 | 13.29 | 12.67 | 17.73 | 14.15 | 12.75 |
| Moody's Total Corporate Bond Rate | 12.59 | 13.36 | 13.40 | 13.05 | 12.64 | 12.28 | 11.84 | 11.51 | 10.03 | 13.10 | 12.07 | 10.74 |

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: March 28, 1980.

be increasing political pressure to stimulate rather than to restrain economic activity. Particularly to the degree that there appears to be a decline in the rate of inflation from the levels near 20 percent implied by the Consumer Price Index in the first two or three months of the year to levels that are at least close to single digit levels, inflation fighting will lose some of its attraction, especially if the unemployment rate has simultaneously begun to climb above 7 percent. It is, of course, possible to cause a recession by accident, as well as by design, but for the moment at least, politics, as much as economics, conditions the economic outlook.

### Footnotes

[1] "The Administration's Anti-Inflation Program of March 1980," *Survey of Current Business*, Vol. 60, No. 3, March 1980, pp. 2-7.

[2] For a discussion of the details of the Revenue Act of 1978 see Joseph C. Wakefield, "Federal Budget Development," *Survey of Current Business*, Vol. 58, No. 11, November 1978, pp. 16-17.

[3] The course of the recovery from 1975 through 1978 is described by Charles Renfro, "The National Economic Situation," *Kentucky Council of Economic Advisors Annual Report 1977* (Lexington, Ky.: Kentucky Council of Economic Advisors, 1977), pp. 1-22; "The National Economic Situation," *Kentucky Council of Economic Advisors Annual Report 1979* (Lexington, Ky.: Kentucky Council of Economic Advisors, 1979), pp. 1-20.

[4] Subsequent revisions in the data for GNP and its components have caused the numbers to be scaled down somewhat, but in the spring of 1979 reports by the Bureau of Economic Analysis, U.S. Department of Commerce, indicated rather substantial increases in consumer purchases in the fourth quarter. See, for example, the April 1979 issue of the *Survey of Current Business*, especially Table 11 (p. 15) and Table 27 (p. 19), which provide data on the compositional purchases of consumers and on the rates of growth of GNP and its components during the period from the fourth quarter of 1977 through the first quarter of 1979. It is easy to read into these tables that the consumer went on a buying binge in late 1978; see also, for example, "The New Debt Economy," *Business Week*, October 16, 1978, pp. 76-150.

[5] The revised numbers appear in the July 1979 issue of the *Survey of Current Business*, Table 27, p. 23. They were first released on or about July 20, 1979. However, it is still necessary to consider these figures tentative, for they are subject to further revision in July 1980, July 1981 and July 1982, and possibly thereafter.

[6] The initial report concerning the rate of growth of real GNP in the third quarter of 1979 was made on or about October 20, 1979. The numbers relating to this report can be found in the October 1979 issue of the *Survey of Current Business*, Table 27, p. 18. Initially, the rate of growth in real GNP during the third quarter of 1979 was reported to be 2.4 percent. In November, this was revised upward to 3.5 percent. Most recently, on or about December 20, the figure was revised down to 3.1 percent. This figure is subject to revision in July 1980, July 1981 and July 1982, and possibly thereafter.

[7] Goeffrey H. Moore, "Measuring the State of the Economy," *National Bureau Report* (New York, New York: National Bureau of Economic Research, Inc.), March 1974, p. 3.

[8] The apparent conflict between the 0.58 percent *absolute* decline in real GNP in the second quarter of 1979 and the 2.3 percent decline at annual rate, as stated earlier in the text, occurs because, in the first instance, what is being measured is the actual percentage drop:

$$\frac{1,422 - 1,430}{1,430} = -0.0058$$

or 0.58 percent. In the second quarter of 1979, real GNP is reported to have been $1,422 billion in 1972 dollars and in the second quarter $1,430 billion. This also happens to repesent the quarterly change in real GNP, at a quarterly rate. The annual rate of change is:

$$-(1.0058)^4 + 1 = -0.02340$$

or 2.3 percent. The relationship between the quarterly and annual rates of change is analogous to an interest rate per quarter compounded versus the annual compound equivalent. It should be noted, however, that the absolute decline only happens to be equal to the quarterly rate in this example; in general, the absolute change could be measured over any time interval.

[9] Moore, op. cit., p. 3. Most of the statements made in this paragraph are directly based upon this article as regards the characteristics of U.S. economic recessions. This short article, of four pages, remains worth reading, and begins with the declaration, "Despite widespread reports to the contrary, the National Bureau of Economic Research has not in the past and does not plan in the future to define a recession in terms of a decline in real GNP for two consecutive quarters."

[10] "Economic Cycles Discussed," *NBER Reporter*, Fall 1979, p. 15.

[11] Kentucky Council of Economic Advisors, *Economic Situation Report*, July 23, 1979. This unpublished report was sent to the Governor and to Kentucky state government agencies on July 23, 1979, in accordance with the Council's obligation to report to the Governor concerning the state of the economy. This was a follow up report to the Council's 1979 *Annual Report*, published in the spring of 1979.

[12] During the period from 1973 to early 1976, the staff of the Kentucky Council of Economic Advisors collected prices and constructed Consumer Price Indices for Lexington and Louisville that were intended to be comparable to the national Consumer Price Index constructed by the Bureau of Labor Statistics. For information concerning the KCEA pricing effort, see U.S. Congress, Senate. Committee on Agriculture and Forestry. *Food Market Structure and Marketing Costs. Hearings Before the Subcommittee on Agricultural Production, Marketing and Stabilization of Prices.* "Statement by Charles Renfro." Washington, D.C., 94th Congress, 1st Session, 1975, pp. 123-136. With the assistance of the Council staff, a pricing study was subsequently established in Tennessee. See, David A. Hake, Russell L. Hamilton, J. Rodney Howard, *Development of Local Area Consumer Price Indexes: The Tennessee Experience* (Knoxville, Tenn.: Center for Business and Economic Research, University of Tennessee, 1978).

[13] Julius Shiskin, "A New Role for Economic Indicators," *Monthly Labor Review*, Vol. 100, No. 11, November 1977, pp. 3-5.

[14] Shiskin, Ibid., p. 4.

[15] See "Technical Notes on the Consumer Price Index Revision," *CPI Detailed Report January 1978* (Washington, D.C.: Bureau of Labor Statistics, U.S. Department of Labor, 1978), pp. 4-7.

[16] A fundamental question is whether one is attempting to measure price changes per se, or the cost of living. The latter is obviously much more subjective in its interpretation.

[17] However, it should be pointed out that any implication of this type follows from the *use* of the Consumer Price Index, not necessarily the characteristics of its construction. The Consumer Price Index was not designed for the way it tends to

be used today. See, for example, the discussion of consumer prices in Chapter 13 of the *BLS Handbook of Methods for Surveys and Studies*, Bulletin 910 (Washington, D.C.: Bureau of Labor Statistics, 1976).

[18]See *Survey of Current Business*, Vol. 56, No. 1, Part II, and later issues for data on the savings rate.

[19]For a description of the spending patterns of single persons and childless households see Fabian Linden, "Singular Spending Patterns," *Across the Board*, July 1979, pp. 31-34.

[20]The February issue of the *Survey of Current Business* each year often provides a description of tax and budgetary developments in the previous year. A yet further reason for the decline in the savings rate is that, as argued by Alan Greenspan in particular, the rise in house prices has increased the value of homeowner assets, thus decreasing their need to save at historically more normal rates.

[21]See, for example, the regular reports on consumer sentiment published in *Economic Outlook USA*, a quarterly publication of the Survey Research Center, Institute of Social Research, University of Michigan.

[22]In fact, to the extent that house buying leads to an increase in the market value and, hence, imputed rental value of housing, which is a component of Personal Income, the effect could conceivably be a rise in the savings rate.

[23]For details, see Charles M. Sivesind, "Mortgage-Backed Securities: The Revolution in Real Estate Finance," *Federal Reserve Bank of New York Quarterly Review*, Vol. 4, No. 3, Autumn 1979, pp. 1-18.

[24]The discussion in this section is based upon the tables and narrative in Christopher L. Bach, "U.S. International Transactions, Fourth Quarter and Year 1979," *Survey of Current Business*, Vol. 60, No. 3, March 1980, pp. 44-52.

[25]See Charles G. Renfro, "The National Economic Situation," *Kentucky Council of Economic Advisors Annual Report 1979* (Lexington, Ky.: Kentucky Council of Economic Advisors, 1979), pp. 9-10.

[26]See Panel to Review Productivity Statistics, *Measurement and Interpretation of Productivity* (Washington, D.C.: National Academy of Science, 1979); John A. Tatom, "The Productivity Problem," *Federal Reserve Bank of St. Louis Review*, Vol. 61, No. 9, September 1979, pp. 3-16; Marvin Duncan and C. Edward Harshbarger, "Agricultural Productivity: Trends and Implications for the Future," *Federal Reserve Bank of Kansas City Economic Review*, September-October 1979, pp. 3-12.

[27]This description of the monetary and policy changes is mainly based upon the reports in the *Wall Street Journal* of Monday, March 17, 1980, especially Robert S. Greenberger, "Fed's Curbs on Credit: Reserve Board in New Attack on Inflation, is Stressing Restraint on Debt Rather than Higher Interest Rates," p. 2.

[28]That the *Annual Report* would contain an updated version of the forecast shown on pp. 3-5 of the March 1980 issue of *Kentucky Economy: Review and Perspective* was announced in the "News and Notes" section of that issue.

[29]In Chapter II, the effect of the March 14 policies, as interpreted by the Wharton Econometric Forecasting Associates, is provided as an addendum. Nevertheless, the National Control Forecast, described earlier in this chapter is the basis for the Kentucky Control Forecast of Chapter II.

[30]See Wharton Econometric Forecasting Associates, *The Wharton Quarterly Model Forecast March 28, 1980: Control Solution Update Executive Summary*. "It is particularly difficult to assess the impact of the new credit control on the economy, but our current view is that the effects will not be large."

# APPENDIX

# NATIONAL FORECAST TABLES

TABLE A-1

NATIONAL CONTROL FORECAST
SELECTED ECONOMIC INDICATORS

| Description | Quarterly | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Gross National Product | 2526.2 | 2571.3 | 2623.8 | 2684.5 | 2750.7 | 2820.2 | 2891.1 | 2969.7 | 2369.4 | 2601.5 | 2857.9 |
| % Chg.: Gross National Product | 11.32 | 7.33 | 8.42 | 9.58 | 10.23 | 10.50 | 10.44 | 11.33 | 11.36 | 9.79 | 9.86 |
| Real Gross National Product | 1445.3 | 1439.6 | 1440.1 | 1443.9 | 1450.2 | 1458.1 | 1466.7 | 1478.3 | 1431.7 | 1442.2 | 1463.3 |
| % Chg.: Real GNP | 1.28 | -1.56 | 0.14 | 1.06 | 1.76 | 2.20 | 2.38 | 3.20 | 2.32 | 0.73 | 1.46 |
| Implicit GNP Deflator | 174.8 | 178.6 | 182.2 | 185.9 | 189.7 | 193.4 | 197.1 | 200.9 | 165.5 | 180.4 | 195.3 |
| % Chg.: Implicit GNP Deflator | 9.95 | 9.01 | 8.21 | 8.37 | 8.51 | 8.01 | 7.92 | 7.95 | 8.84 | 9.00 | 8.26 |
| Personal Income | 2054.8 | 2104.3 | 2166.4 | 2223.9 | 2279.3 | 2340.6 | 2411.8 | 2477.6 | 1923.7 | 2137.4 | 2377.3 |
| Total Civilian Employment | 97.84 | 96.14 | 96.90 | 98.13 | 98.48 | 98.93 | 99.72 | 100.41 | 96.95 | 97.25 | 99.39 |
| Civilian Labor Force | 104.41 | 103.62 | 104.01 | 105.38 | 105.63 | 105.75 | 106.65 | 107.07 | 102.91 | 104.40 | 106.29 |
| U.S. Population | 221.6 | 222.1 | 222.6 | 223.1 | 223.6 | 224.1 | 224.6 | 225.1 | 220.6 | 222.4 | 224.4 |
| Unemployment Rate | 6.26 | 7.21 | 6.83 | 6.88 | 6.78 | 6.45 | 6.49 | 6.21 | 5.79 | 6.85 | 6.50 |
| 90 Day Treasury Bill Rate | 13.92 | 13.01 | 9.00 | 8.52 | 8.11 | 8.07 | 8.20 | 8.30 | 10.07 | 11.11 | 8.17 |
| Federal Funds Rate | 16.01 | 16.70 | 11.40 | 9.80 | 8.70 | 8.60 | 8.53 | 8.65 | 11.19 | 13.47 | 8.62 |
| Bank Prime Loan Rate | 16.90 | 18.80 | 12.20 | 10.36 | 9.25 | 10.21 | 10.41 | 10.50 | 12.67 | 14.56 | 10.09 |
| Moody's Total Corporate Bond Rate | 12.80 | 13.60 | 11.30 | 9.65 | 8.90 | 9.30 | 9.60 | 9.75 | 10.03 | 11.84 | 9.39 |
| Federal Surplus (+) or Deficit (-) | -18.5 | -34.6 | -26.4 | -18.3 | -15.6 | -12.5 | -10.4 | -9.0 | -11.0 | -24.45 | -11.88 |

SOURCE: Author's forecast, made using the Wharton Mark IV Quarterly Econometric Model of the United States. Forecast date: March 15, 1980.

TABLE A-2

WHARTON QUARTERLY ECONOMETRIC MODEL
SELECTED MAJOR ECONOMIC INDICATORS

| Item | Quarterly Forecasts | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Gross National Product | 2503.6 | 2546.9 | 2597.8 | 2657.8 | 2727.9 | 2793.6 | 2862.5 | 2935.7 | 2368.5 | 2576.5 | 2829.9 |
| Percent Change | 8.01 | 7.10 | 8.25 | 9.56 | 10.97 | 9.98 | 10.24 | 10.63 | 11.33 | 8.78 | 9.83 |
| Real Gross National Product | 1432.4 | 1428.8 | 1430.1 | 1432.1 | 1439.3 | 1446.9 | 1456.5 | 1465.7 | 1431.1 | 1430.9 | 1452.1 |
| Percent Change | -1.65 | -1.00 | 0.35 | 0.57 | 2.03 | 2.13 | 2.66 | 2.56 | 2.28 | -0.02 | 1.49 |
| Implicit Price Deflator | 174.8 | 178.2 | 181.7 | 185.6 | 189.5 | 193.1 | 196.5 | 200.3 | 165.5 | 180.1 | 194.9 |
| Percent Change | 9.80 | 8.18 | 7.87 | 8.94 | 8.76 | 7.68 | 7.38 | 7.86 | 8.88 | 8.81 | 8.21 |
| Percent Change Consumer Price Index | 14.26 | 9.78 | 9.46 | 9.67 | 9.33 | 8.73 | 8.81 | 8.81 | 11.41 | 11.98 | 9.24 |
| Percent Change Wholesale Price Index | 16.04 | 12.59 | 10.46 | 9.69 | 9.44 | 8.60 | 9.08 | 9.26 | 12.48 | 13.74 | 9.58 |
| Personal Income | 2042.0 | 2085.8 | 2146.3 | 2201.0 | 2241.0 | 2291.0 | 2356.2 | 2417.4 | 1923.0 | 2118.8 | 2326.4 |
| Total Civilian Employment | 97.67 | 97.76 | 97.88 | 98.02 | 98.21 | 98.41 | 98.65 | 98.92 | 96.97 | 97.83 | 98.55 |
| Non-Ag. Wage & Salary Employment | 94.43 | 94.56 | 94.71 | 94.88 | 95.08 | 95.31 | 95.58 | 95.87 | 93.68 | 94.64 | 95.46 |
| Manufacturing | 20.69 | 20.55 | 20.44 | 20.37 | 20.35 | 20.36 | 20.41 | 20.46 | 21.00 | 20.52 | 20.40 |
| Durable Goods | 12.43 | 12.30 | 12.21 | 12.16 | 12.16 | 12.19 | 12.25 | 12.31 | 12.71 | 12.28 | 12.23 |
| Nondurable Goods | 8.26 | 8.25 | 8.23 | 8.21 | 8.19 | 8.17 | 8.16 | 8.15 | 8.29 | 8.24 | 8.17 |
| Total Civilian Labor Force | 104.26 | 104.83 | 105.39 | 105.92 | 106.27 | 106.64 | 106.95 | 107.28 | 102.93 | 105.10 | 106.79 |
| Total U.S. Population | 221.6 | 222.1 | 222.6 | 223.1 | 223.6 | 224.1 | 224.6 | 225.1 | 220.5 | 222.4 | 224.4 |
| Federal Reserve Board Industrial Production Index | 151.4 | 150.7 | 151.2 | 152.3 | 152.6 | 153.3 | 154.2 | 155.1 | 152.1 | 151.4 | 153.8 |
| Percent Change | -1.8 | -1.8 | 1.6 | 2.9 | 0.8 | 1.7 | 2.4 | 2.3 | 4.1 | -0.5 | 1.6 |
| Unemployment Rate (Percent) | 6.32 | 6.74 | 7.13 | 7.46 | 7.59 | 7.72 | 7.76 | 7.79 | 5.79 | 6.91 | 7.71 |
| Net Exports (Billions 1972 $) | 21.1 | 23.3 | 25.2 | 24.7 | 26.3 | 26.8 | 27.4 | 26.6 | 17.7 | 23.6 | 26.8 |
| Money Supply–$M_1$ | 387.3 | 390.5 | 396.2 | 402.4 | 405.7 | 410.2 | 415.0 | 421.7 | 371.0 | 394.1 | 413.1 |
| Percent Change | 6.89 | 3.34 | 5.97 | 6.47 | 3.34 | 4.44 | 4.74 | 6.65 | 5.15 | 6.22 | 4.84 |
| Corporate Profits Before Tax | 244.2 | 227.5 | 219.1 | 211.6 | 211.5 | 213.6 | 216.2 | 214.6 | 237.1 | 225.6 | 214.0 |

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: January 28, 1980.

TABLE A-3

WHARTON QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: EFFECT OF POLICIES ANNOUNCED MARCH 14, 1980
SELECTED MAJOR ECONOMIC INDICATORS

| Item | Quarterly Forecasts | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Gross National Product | 2519.7 | 2564.6 | 2613.4 | 2670.5 | 2742.2 | 2809.1 | 2883.9 | 2961.7 | 2368.8 | 2592.1 | 2849.2 |
| Percent Change | 10.63 | 7.31 | 7.84 | 9.03 | 11.17 | 10.11 | 11.10 | 11.23 | 11.34 | 9.42 | 9.92 |
| Real Gross National Product | 1444.4 | 1438.3 | 1433.4 | 1431.7 | 1437.0 | 1442.0 | 1451.1 | 1459.0 | 1431.6 | 1436.9 | 1447.3 |
| Percent Change | 1.15 | -1.68 | -1.37 | -0.47 | 1.49 | 1.40 | 2.56 | 2.19 | 2.32 | 0.37 | 0.72 |
| Implicit Price Deflator | 174.4 | 178.3 | 182.3 | 186.5 | 190.8 | 194.8 | 198.7 | 203.0 | 165.5 | 180.4 | 196.8 |
| Percent Change | 9.38 | 9.14 | 9.34 | 9.55 | 9.54 | 8.59 | 8.33 | 8.84 | 8.85 | 9.04 | 9.11 |
| Percent Change Consumer Price Index | 16.08 | 13.01 | 12.41 | 10.08 | 9.78 | 9.24 | 9.36 | 9.63 | 11.47 | 13.58 | 10.18 |
| Percent Change Wholesale Price Index | 21.18 | 18.91 | 15.36 | 12.61 | 12.03 | 11.60 | 11.21 | 10.77 | 12.48 | 17.04 | 12.66 |
| Personal Income | 2053.0 | 2099.7 | 2162.5 | 2216.9 | 2257.6 | 2307.2 | 2374.0 | 2435.1 | 1924.2 | 2133.0 | 2343.5 |
| Total Civilian Employment | 97.91 | 98.08 | 98.16 | 98.19 | 98.35 | 98.50 | 98.71 | 98.96 | 96.95 | 98.08 | 98.63 |
| Non-Ag. Wage & Salary Employment | 94.65 | 94.84 | 94.98 | 95.01 | 95.17 | 95.34 | 95.56 | 95.84 | 93.65 | 94.86 | 95.48 |
| Manufacturing | 20.81 | 20.72 | 20.58 | 20.44 | 20.39 | 20.36 | 20.35 | 20.38 | 20.98 | 20.64 | 20.36 |
| Durable Goods | 12.56 | 12.48 | 12.37 | 12.26 | 12.20 | 12.16 | 12.15 | 12.15 | 12.70 | 12.42 | 12.16 |
| Nondurable Goods | 8.25 | 8.24 | 8.21 | 8.18 | 8.19 | 8.20 | 8.20 | 8.23 | 8.28 | 8.22 | 8.20 |
| Total Civilian Labor Force | 104.36 | 104.91 | 105.56 | 106.12 | 106.44 | 106.80 | 107.08 | 107.41 | 102.91 | 105.24 | 106.93 |
| Total U.S. Population | 221.6 | 222.1 | 222.6 | 223.1 | 223.6 | 224.1 | 224.6 | 225.1 | 220.5 | 222.4 | 224.4 |
| Federal Reserve Board Industrial Production Index | 152.7 | 152.2 | 151.5 | 151.0 | 151.0 | 151.8 | 152.7 | 153.6 | 152.1 | 151.8 | 152.3 |
| Percent Change | 1.3 | -1.3 | -1.8 | -1.3 | 0.2 | 1.9 | 2.6 | 2.4 | 4.1 | -0.2 | 0.3 |
| Unemployment Rate (Percent) | 6.18 | 6.51 | 7.01 | 7.47 | 7.61 | 7.77 | 7.82 | 7.86 | 5.79 | 6.79 | 7.77 |
| Net Exports (Billions 1972 $) | 18.3 | 21.4 | 23.1 | 21.6 | 22.4 | 21.9 | 20.4 | 17.0 | 17.6 | 21.1 | 20.4 |
| Money Supply–$M_1$ | 383.1 | 386.4 | 391.9 | 397.5 | 400.2 | 404.2 | 408.0 | 413.2 | 371.0 | 389.7 | 406.4 |
| Percent Change | 2.40 | 3.50 | 5.81 | 5.89 | 2.67 | 4.05 | 3.84 | 5.26 | 5.15 | 5.05 | 4.27 |
| Corporate Profits Before Tax | 259.7 | 244.9 | 236.6 | 227.1 | 229.2 | 236.8 | 247.5 | 253.5 | 237.4 | 242.1 | 241.8 |

SOURCE: Wharton Econometric Forecasting Associates. Forecast date: March 28, 1980.

# II. The Kentucky Economic Situation

by Charles Renfro

The purpose of this chapter is to assess the economic situation of Kentucky at the beginning of 1980 and to compare the performance of the state economy with that of the national economy. In the context of an annual report such as this, it is usual to review the performance of an economy during the recent past, focusing attention upon a period of time that may be as short as a year or two. However, the Kentucky economy today is the result of its development over a much longer period of time. Limiting attention to only the past year or two inevitably risks overemphasizing what will later be seen to be transitory events. Every so often, therefore, it is helpful to pause, extend the focus, and consider not just the past year, but a number of years. The beginning of both a new decade and a new administration provides a particularly appropriate occasion for such reflection.

This chapter is divided into three parts. The first part reviews the general characteristics of the Kentucky economy's performance over the past two decades, but it primarily focuses upon the past five to ten years. The second part provides an assessment of the current condition of the economy. The third part presents a statement of the economic outlook in the form of two forecasts, each made using the Kentucky Quarterly Econometric Model. One forecast assumes that the national economy will perform sluggishly in 1980, but not experience a recession during the year. The other is based upon the assumption of a mild national recession.

## The Kentucky Economy: The Past Twenty Years

### General Characteristics

As a general rule, economic cycles do not follow the calendar, nor is it always wise to assume a standard regularity in the pace of economic events. However, each of the past two decades began with a year of weak economic performance, and each ended with at least five years of sustained economic growth. The year 1969 was the final year of a period of growth in Kentucky that started early in the 1960s and continued throughout the decade; and not only did the state economy grow robustly during this decade, especially at the end, but it experienced a fundamental change in its industry composition. Similarly, the year 1979 also followed four years of economic growth and it is possible that, like 1969 also, 1979 will be followed by a year of mild recession. Of course, the 1970s were not years of uninterrupted economic prosperity, for there was a severe national recession in 1974-75, which also had a noticeable effect on the state economy. However, from at least the spring of 1975 to the present time there has been continued economic growth, building upon the foundations laid in the previous decade.

One of the best available measures of the performance of an economy over a given period of time is the rate of change in aggregate Personal Income.[1] From 1969 to 1979, the total Personal Income of Kentuckians increased by about 185 percent, reflecting the growth of the state economy, but also, unfortunately, the generally high rates of inflation during the 1970s; taking into account the effects of inflation, real total Personal Income increased by about 55 percent from 1969 to 1979. And not only did total income grow during this time, both in nominal and in real terms, but so also did per capita Personal Income. Nominal per capita income grew from an estimated $2,912 in 1969 to $7,343 in 1979, an increase of just over 152 percent; measured in 1972 dollars, real per capita income increased from $3,291 in 1969 to $4,552 in 1979, an increase of about 38 percent.[2] The difference in the per capita and total percentage increases reflects the increase in population that occurred in the 1970s.

These figures gain additional meaning in comparison with the equivalent figures for the United States as a whole. During the 1970s, Kentucky per capita income also increased as a percentage of U.S. per capita income, rising from about 78 percent of the U.S. figure in 1969 to about 84 percent in 1979; these figures are the same in either real or current dollar terms.[3] The implication is that, on average, residents of the state improved their relative economic well-being during the 1970s compared to the average American.

Another indication of Kentucky's economic growth during the 1970s is the increase in the number of jobs. For example, in 1969, nonagricultural wage and salary employment in the state was about 895 thousand. In 1979, it was approximately 1,272 thousand, an increase

of 42 percent.[4] Since both 1969 and 1979 represent employment high water marks for their decades, a comparison of the two years is appropriate. These employment numbers are also interesting in comparison with the United States as a whole: the corresponding employment percentage increase for the United States was only about 27 percent.

Comparing other aspects of the performance of the Kentucky economy in the 1970s to that in the 1960s also provides interesting results. The period from the late 1950s through the 1960s and into the early 1970s was a period during which Kentucky was becoming progressively more of a manufacturing state. During the 1960 to 1974 period, Kentucky experienced nearly a 75 percent increase in manufacturing jobs, which is almost four times the national rate of growth in manufacturing during this same period. In 1974, manufacturing provided employment for approximately 8.7 percent of the population of Kentucky; this compares to a corresponding 9.5 percent nationally. Similarly, while the increase in nonagricultural, nonmanufacturing employment was not as startling during this time, it was nevertheless substantial; from 1960 to 1974, this type of employment increased by almost 62 percent in Kentucky, as compared to an increase of about 56 percent nationally.

Such growth cannot continue indefinitely, and the period after 1974 was a time of relatively slower employment growth. Nevertheless, between 1969 and 1979, Kentucky experienced an increase of just over 19 percent in manufacturing jobs, compared to an increase of just over 4 percent nationally; this clearly represents a relative gain for Kentucky. Similarly, from 1969 to 1979, Kentucky experienced an increase of about 52 percent in nonagricultural, nonmanufacturing jobs, compared to an increase of about 36 percent nationally; another relative gain for Kentucky.

Charting and comparing the overall performance of the economy gives an impression of Kentucky's recent economic history, but it is also important to consider this economy in terms of its major industry divisions. Kentucky is now close to being an average manufacturing state; manufacturing now employs about 8.3 percent of the Kentucky population, compared to about 9.5 percent at the national level.[5] At the same time, Kentucky is still an agricultural state, with output including tobacco, soybeans, corn and seed crops, as well as livestock and dairy products.[6] In addition, except for one year, ever since 1971 Kentucky has been the leading coal producing state.[7]

Kentucky's industry structure obviously affects its economic performance and during the 1970s, the combination of manufacturing, mining and agriculture resulted in a fairly stable overall performance. In particular, during the 1974-75 recession, the effects of the recession were somewhat muted in Kentucky as a result of the fact that both agricultural and coal prices were raised as a result of world economic conditions.[8] Because of these higher prices, and the attendant response on the part of farmers and mine operators, Kentucky came through that recession with two of its major industries experiencing a relatively high degree of prosperity.[9] Among the apparent consequences of this circumstance were a greater than anticipated state government surplus of receipts over appropriated expenditures during the 1974-75 period—in large part because of the coal severance tax—and a generally rising level of employment in the state. From the beginning of 1975 through 1979, total employment continued to increase in Kentucky notwithstanding the fact that Kentucky manufacturing employment decreased more than commensurately with the national decline through the first quarter of 1975, and only in late 1978 regained the peak level of 1974.

Kentucky's broadly based industry structure gives the impression of having a balanced economy. However, if the broad industry representation in Kentucky is important to the explanation of its economic performance, so also is the representation at a more disaggregate level. At an aggregate level, Kentucky appears to have balance, but upon closer inspection its industries are relatively specialized. The particular minerals extracted in Kentucky explain the performance of the mining industry as a whole during the 1970s, especially as coal production perennially represents about 90 percent of the value of minerals extracted in the state. The agricultural produce is relatively wide in range, but certain products are of particular importance, such as tobacco. In manufacturing, the performance of the industry reflects the fact that the durable goods industry tends to be concentrated in the production of nonauto consumer durables, although there is considerable production of motor vehicle parts, and that the nondurable goods industry is somewhat specialized to the production of distilled spirits and other food products and tobacco; beyond this, the apparel and textile industry produces certain types of finished and semi-finished goods and there is also some petroleum refining in Kentucky. The specific characteristics of the Kentucky economy are important and may also largely explain the state's economic performance during the 1970s.

## Manufacturing

As an industry, manufacturing is the largest single income and employment generating sector of the Kentucky economy, a role that it has played for most of the past twenty years. Both in Kentucky and nationally, manufacturing accounts for over 20 percent of nonagricultural wage and salary employment.[10] As a result,

there are certain similarities in the behavior of the Kentucky and national industries during the 1970s. However, there are also important differences, reflecting the particular compositional characteristics of the national and state industries.

It is pertinent to consider several aspects of the comparative cyclical behavior of manufacturing employment in Kentucky and the United States during the period from 1973 to the present time. This period includes the last recession, the "great recession" of 1974-75, and the subsequent recovery. Just prior to this recession, nearly all of Kentucky's manufacturing industries reached their cyclical employment peaks during or before the third quarter of 1974.[11] In addition, this quarter essentially marks the end of a secular structural shift within manufacturing in Kentucky, away from the relatively stable, nondurable manufacturing activities and towards the more cyclical, yet higher paying, durable manufacturing industries. It is interesting that in the early 1960s, about 50 percent of manufacturing employment was in durable manufacturing, but that by 1974, this share had risen to just over 58 percent.

In broad terms, Kentucky and U.S. manufacturing employment behaved in a similar manner during the 1974-75 recession, but considered more closely the full impact was felt later in Kentucky and more severely. Certain two-digit industries in Kentucky reached their employment peaks at essentially the same time as the corresponding national industries–industries such as electrical and nonelectrical machinery and petroleum and coal products. But, for the most part, the effect in the state was somewhat delayed, and nearly all the state's durable manufacturing industries made greater percentage cuts in their work force than occurred at the national level. A consequence of this cut in employment in Kentucky was a drop in the percent of durable manufacturing employment from 58 percent of manufacturing employment prior to the recession, as noted, to about 55 percent at the trough.

The industries most affected in Kentucky were almost the same as those most affected nationally. All the durable goods industries, except nonelectrical machinery, and the textiles, apparel, and rubber and plastic products industries, among nondurables, experienced greater percentage employment declines than did the manufacturing industry as a whole–both for Kentucky and the U.S.[12]

Of course, percentage declines in employment do not measure the full impact of a recession; the duration of the layoffs is equally important. However, the findings are essentially the same if the lengths of the respective peak to trough periods are considered. In Kentucky, durable manufacturing experienced a lengthy recession as did also textiles and apparel among the nondurables, both in Kentucky and nationally.

Subsequent to the recession, there were differences in the behavior of the durable and nondurable manufacturing industries in Kentucky. As a rule, the nondurable industries regained their prerecession peaks faster than the corresponding U.S. industries. In contrast, the durable industries in the state were slower in recovery than their U.S. counterparts. These differences are not surprising if account is taken of the fact that the nondurable industries in Kentucky were less affected by the recession than the nondurable U.S. industries. However, these results do suggest the possible instability of the strong growth in durables experienced in Kentucky in 1974 and previously. A recovery noted for its ability to produce a record number of new jobs might be expected to stimulate manufacturing employment; it might be expected that not only would most industries regain their prerecession peaks, but that employment would exhibit net expansion early in the recovery. However, not until 1979 did many manufacturing industries in Kentucky recover their 1974 employment levels; even now certain industries are below these levels.

Nevertheless, certain industries have grown substantially since the 1975 trough, and they are responsible for any net expansion that manufacturing may realize in this economic cycle. Chemical and allied products have created the greatest percentage of nondurable jobs in Kentucky, as has printing and publishing for the United States as a whole. Among the durable goods industries, nonelectrical machinery has been the major growth industry both in Kentucky and the United States. Until 1979, there was also substantial growth in transportation equipment employment in Kentucky, reflecting both the expansion in this industry into Kentucky and the strength of business and consumer demand for its products.

## Mining

The minerals extracted in Kentucky include natural gas, crude petroleum, stone, sand and gravel, clays, zinc, and certain other items, but, above all, Kentucky is a coal mining area, incorporating in western Kentucky part of a coal basin that is shared with Illinois and Indiana and in eastern Kentucky another coal basin shared with several other major coal producing states such as Pennsylvania, Virginia and West Virginia. In Kentucky, coal revenues account for more than 90 percent of the value of mineral production in the state; for example, in 1976, the latest year for which the necessary data are now available, coal accounted for 91.5 percent of this value. Similarly, in that year, coal mining employment accounted for more than 89 percent of the mining employment in the state. Thus, while conditions in the coal industry do not fully account for

Kentucky mineral production and employment, not much error is created by ignoring the other sectors in considering the year to year changes in the industry or even its general performance during the decade of the 1970s.

For the coal industry, this decade began well: even in the initial years of the 1970s, employment had begun to expand from the modern low of just over 20.5 thousand in 1969; employment increased by more than 25 percent and reached an average of 26 thousand even before the fateful autumn of 1973. However, the oil embargo, starting then and extending into 1974, played a major role in creating the "coal boom" of the mid 1970s. Between 1969 and 1976, coal employment effectively doubled in Kentucky and production increased from 109 million tons to nearly 144 million tons, as shown in Table 1, to reach in 1977 what remains the modern peak production level.[13] Since 1976, employment has continued to increase fairly steadily, but production has decreased from the level of 1977, a decline that is only partially due to the coal strike of 1977-78.

TABLE 1

KENTUCKY COAL PRODUCTION, 1969-79
(Millions of Short Tons)

| Year | Eastern Kentucky | Western Kentucky | Kentucky Total |
|---|---|---|---|
| 1969 | 61.584 | 47.466 | 109.050 |
| 1970 | 72.502 | 52.803 | 125.305 |
| 1971 | 71.569 | 47.819 | 119.389 |
| 1972 | 68.858 | 52.330 | 121.187 |
| 1973 | 73.966 | 53.679 | 127.645 |
| 1974 | 85.356 | 51.841 | 137.197 |
| 1975 | 87.257 | 56.356 | 143.613 |
| 1976 | 91.138 | 52.834 | 143.972 |
| 1977 | 93.957 | 52.305 | 146.262 |
| 1978 | 96.233 | 39.456 | 135.689 |
| 1979 | 97.500 | 44.500 | 142.000 |

SOURCE: U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook* (1969-1976); U.S. Department of Energy, Energy Information Administration, *Energy Data Reports* (various issues, 1977-1979); Kentucky Economic Information System.

In retrospect, it is possible to see the coal boom of the mid 1970s as having been the consequence of speculative excess: an attempt by utilities to stockpile coal during this period partially caused the increase in both prices and the level of activity in the coal fields between 1973 and 1976. However, in assessing conditions in the coal industry then, it is important to consider the full range of circumstances of that period. In addition to the demand for steam coal, there was also strong demand for metallurgical coal. In 1973 and 1974, there was a broadly based perception of a materials shortage. Metals, particularly iron and steel, were in short supply, and as a consequence, the attempt to produce more increased the demand for coal.[14] Furthermore, during the late 1973, early 1974 period, other conditions, such as the coal strike in Britain, helped to increase the degree of uncertainty that characterized that time.

Similarly, in explaining the fortunes of coal since 1976, it is necessary to take into account not only the relatively decreased demand for steam coal on the part of the electric utilities, but also the more recent worldwide glut of steel and steel manufacturing capacity. The demand for electricity in the last five or six years has been less than was generally expected in 1973 and 1974 and, the oil price-induced switch of utilities to coal has also been less than expected.[15] The U.S. steel industry has found itself with overcapacity in steel making facilities and somewhat technologically backward in comparison to steel making industries in other countries. In addition, in the past few years, an improvement in the applied technology for making steel, both in the United States and abroad, has resulted in a lower consumption of coal per ton of steel produced. There has been both a cutback in the rate of steel production and a more than proportional reduction in coal consumption to produce the steel.

Furthermore, as is evident from Table 1, coal production in Kentucky since 1974 reflects the effect of existing or expected environmental regulations. A continuing increase in coal production in eastern Kentucky illustrates that the coal produced in this part of the state tends to be high energy, low sulphur content coal. In contrast, there has been a decline in the coal produced in western Kentucky and this is particularly obvious in the data for 1978, even allowing for the effects of the strike. Coal in western Kentucky can be generally characterized as having both a high energy and a high sulphur content.

And, of course, during the period from 1973 to the present time, the western United States has become an important coal producing area, even in the absence of a national commitment to the use of coal to meet the country's energy needs. The lengthy eastern coal strike of 1977-78 aided the development of the western U.S. coal fields, having the effect not only of fissuring the United Mine Workers of America, but of disrupting the historical pattern of coal supply, thus affecting the market for competing Kentucky coal. The developments in the Kentucky coal industry since 1973 reflect all these circumstances.

TABLE 2

KENTUCKY COAL MINING EMPLOYMENT, 1969-79
(Thousands)

| | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern Kentucky | 17.145 | 20.452 | 21.671 | 20.206 | 20.499 | 27.824 | 25.450 | 29.481 | 32.791 | NA | NA |
| Western Kentucky | 4.136 | 5.239 | 6.581 | 7.410 | 7.476 | 9.221 | 10.620 | 10.012 | 12.698 | NA | NA |
| Kentucky Total[1] | 21.281 | 25.691 | 28.252 | 27.616 | 27.975 | 37.045 | 36.070 | 39.493 | 45.489 | NA | NA |
| Kentucky Total[2] | 20.533 | 22.733 | 24.717 | 26.392 | 26.683 | 34.433 | 41.475 | 41.817 | 43.508 | 47.883 | 54.308 |

NA = Not available at publication time.

SOURCE: [1]U.S. Department of the Interior, Bureau of Mines, *Minerals Yearbook* (1969-1976); U.S. Department of Energy, Energy Information Administration, *Energy Data Reports* (various issues, 1977-1979); Kentucky Economic Information System.

[2]Kentucky Department for Human Resources, BLS 790 Monthly Survey of Establishments; Kentucky Economic Information System.

## Agriculture

As a consequence of the fundamental change in farming methods that has occurred, agriculture has experienced a secular decline in employment during the postwar period. This decline was generally evident during the past ten years, as can be seen from Table 3; however, during the years 1974 through 1976 there was a rise in employment, reflecting the special conditions during these years. The combination of a rise in farm prices, reflecting the strong demand for agricultural goods in 1974-75 particularly, and the weak performance of the manufacturing industries, appears to have resulted in at least some part-time farmers returning to full-time farming. As suggested earlier, agriculture experienced a boom during the 1973 to early 1975 period, which then tapered off as the prices of both livestock and grain fell during 1975-76.

The specific characteristics of the Kentucky agricultural industry are described in a later chapter,[16] but in general, during the 1970s, there was an increase in the production of corn, soybeans and wheat, with most of the increase occurring during the 1969 and 1977 period, followed by a weak year in 1978. The production of

TABLE 3

KENTUCKY AGRICULTURAL STATISTICS

| | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Agricultural Employment (Units) | 107,692 | 94,183 | 84,217 | 78,442 | 71,333 | 85,942 | 85,375 | 91,542 | 87,358 | 73,058 | 70,425* |
| Hired Farm Workers | 28,250 | 28,083 | 27,750 | 27,583 | 29,583 | 32,500 | 20,750 | 29,500 | 28,500 | 32,500 | 20,750* |
| Non-Hired Farm Workers | 79,442 | 66,100 | 56,467 | 50,859 | 41,750 | 53,442 | 64,625 | 62,042 | 58,858 | 40,558 | 49,675* |
| Total Cash Receipts (Millions $) | 886.3 | 922.0 | 929.1 | 1078.2 | 1319.4 | 1482.9 | 1441.0 | 1652.4 | 1730.0 | 2039.0 | 2250.9* |
| Livestock and Products | 491.3 | 515.2 | 529.6 | 595.7 | 742.5 | 583.2 | 676.1 | 730.1 | 730.6 | 999.8 | 1111.0* |
| Crops | 395.0 | 406.8 | 399.5 | 482.5 | 576.9 | 899.7 | 764.8 | 922.3 | 999.4 | 1040.1 | 1139.9* |
| Total Net Farm Income (Millions $) | 389.9 | 361.1 | 370.2 | 480.2 | 562.1 | 648.8 | 473.3 | 561.6 | 572.3 | 535.4 | NA |

*Preliminary figures.
NA = Not available.

SOURCE: *Kentucky Farm Labor* and *Kentucky Agricultural Prices*, Kentucky Crop and Livestock Reporting Services, U.S. Department of Agriculture; Kentucky Economic Information System.

cattle and calves also increased during the early years of the 1970s, but beginning in 1976 there was a progressive decline in the number of cattle and calves, reflecting the low prices of the 1975 to 1978 period. But if the second half of the decade experienced a contraction in cattle and calf production that has only recently come to a halt, hog numbers have climbed steadily during the past five years. Furthermore, throughout the past ten years, with the exception of 1979, tobacco production levels have been generally maintained. Thus, the overall performance of agriculture as an industry reflects the net results of a number of circumstances.

Table 3 illustrates the overall performance of the Kentucky agricultural industry, and it is evident that, in terms of net farm income, the period is divided into two halves, with 1975 being the weak separating year. The figure of $473 million for 1975 was below both the $562 million of 1973 and the record $649 million of 1974. Since 1975, there has been a rise in net farm income which reached $562 million in 1976, $572 million in 1977, and then dropped somewhat to $535 million in 1978, the latest year for which a figure has been reported. The lower volume of burley tobacco sales, as a consequence of the weather in 1979, may have lead to a yet lower net farm income figure for 1979.

## Other Aspects of the Kentucky Economy

The growth of such industries as agriculture, manufacturing, and mining in the 1970s can be seen to reflect the particular characteristics of Kentucky, as well as those of the national economy during this time. For example, the growth that occurred in agricultural output and, more generally, in mining is the result of the natural resource base of Kentucky, and national and international demand conditions. However, at the same time, it is important to recognize that the state's ranking among coal producing states is also a consequence of such things as the relatively low rate of union participation among miners in Kentucky and, historically, the relative infrequency of strikes in the Kentucky coal fields, especially in comparison with the second ranking coal producing state, West Virginia.

Similarly, the growth in manufacturing from the fifties through the 1970s is due to several circumstances. Location is an important factor. Kentucky is more or less in the center of a twenty-eight state area containing more than 70 percent of the U.S. population and accounting for more than 80 percent of U.S. manufacturing employment. Competitiveness of industry is important. Although they are now beginning to match levels for the United States, manufacturing straight-time wage rates in Kentucky have been lower than the corresponding national rates. Furthermore, the proportion of taxes that are raised from business in Kentucky is less than that for most other states.[17] Moreover, the business tax structure is well distributed and not punitive to particular industries. In addition, labor availability is at least adequate. Manufacturing employment gains during the past twenty-year period have been greatest in the smaller, semi-rural areas of the state, and this has tended to facilitate the transfer of labor from agriculture to manufacturing.[18] A further, very important enabling factor has been the accelerated development of the highway system in Kentucky since the late 1950s, in the form of both the Interstate System and limited-access parkways. In the absence of this road building, Kentucky's terrain would have significantly retarded the expansion of manufacturing.

These circumstances have been important to the development of the particular industries; however, they have also contributed to the general economic development of Kentucky, both directly and indirectly. The expansion of agriculture, manufacturing and mining has generated wage and salary income and, in addition, the development of these particular nationally-oriented industries has provided a growing direct market for the goods and services of other, more locally-oriented industries.

The multiplier effect of income generation is so well known today that its magnitude is often optimistically over-estimated, but in considering the development of the Kentucky economy during the past ten to fifteen years it is important to recognize also the particular effects of the rise in relative per capita income in Kentucky, compared to the United States as a whole. A result of the relative rise in Kentucky per capita income has been a change in the composition of consumer purchases, and the growth in retail trade in recent years provides an indication of how Kentuckians have spent their increased income. For example, during the period of robust economic growth from 1967 to 1972, retail sales in Kentucky increased by almost 60 percent.[19] Of the major categories, automotive dealers' sales showed the largest percentage increase of more than 75 percent, followed by general merchandise group stores at 70 percent. The smallest increase during this period was the 44 percent experienced by drug and proprietory store sales.

These figures are obtained from the Census of Retail Trade, but detailed sales tax receipts from the Kentucky Department of Revenue tell very much the same story. During the past fifteen to twenty years, Kentuckians have spent their income as if to catch up with the national averages in the ownership of automobiles, appliances and other household items, and other goods and services.[20] As per capita personal income in Kentucky has risen towards the national average, so also has ownership and use of a wide range of consumer goods and services. This general rise goes some distance towards explaining the

growth not only of such industries as wholesale and retail trade, but also of services; finance, insurance, and real estate; and the regulated industries, including transportation, communications, and public utilities. A measure of the effect of growth in sales is employment growth and during the 1969 to 1979 period, excluding mining, the fastest growing private industries were wholesale and retail trade, 51 percent; finance, insurance, and real estate, 45 percent; and contract construction, 34 percent. Interestingly, as shown in Table 4, another growth "industry" was government, and the only industry to experience an employment decrease was agriculture. Note also that in comparison to most others, manufacturing was a relatively slow growing industry during this time.

TABLE 4

EMPLOYMENT GROWTH RATES BY INDUSTRY

| Industry | Percent Change 1969-79 |
|---|---|
| Agriculture | -35 |
| Manufacturing, Total | 19 |
| Manufacturing, Durable | 28 |
| Manufacturing, Nondurable | 8 |
| Mining | 108 |
| Mining, Bituminous Coal and Lignite Mining | 141 |
| Contract Construction | 34 |
| Transportation, Communications, and Public Utilities | 21 |
| Wholesale and Retail Trade | 51 |
| Finance, Insurance, and Real Estate | 45 |
| Civilian Government | 38 |

SOURCE: Kentucky Department for Human Resources; Kentucky Economic Information System.

For perspective, these findings should be considered in a regional and national context. An earlier study by Lynch in the 1979 KCEA *Annual Report* describes the growth in employment by industry in Kentucky and compares this to the experience both nationally and in the other "sunbelt" states.[21] In the context of the Lynch analysis, it is evident that in many respects the compositional changes that have occurred in the Kentucky economy mirror those in other sunbelt states, differing more in degree than in character. Considering the Kentucky economy in isolation risks, on the one hand, overemphasizing the significance of the compositional change that occurred and, on the other, underemphasizing Kentucky's growth during the 1970s. Compared to the northern mid-western and the northeastern states, or the country as a whole, the Kentucky economy performed very well, but in comparison with the other sunbelt states Kentucky does not stand out as significantly different in its overall statistical performance.[22]

Similarly, if the state economy's growth during the past decade is compared with that during the period from the mid-sixties through the early seventies, it becomes less impressive. However, this economy's performance during the 1970s was conditioned by the environment of this decade and reflects national and international economic conditions at least as much as any circumstances particular to Kentucky.[23] Nationally, as well as in Kentucky, the 1970s were years of less robust growth than the 1960s, a fact that must be recognized in considering the state's economic performance in each of these decades.

## The Kentucky Economy in 1979

The year 1979 was one of mixed economic performance for Kentucky. Final figures are not yet available, but it now appears that total personal income rose by approximately 12.5 percent from $23 billion in 1978 to an estimated $26 billion in 1979.[24] Real personal income increased by almost 3.3 percent from $15.4 billion to just over $15.9 billion. This income increase reflects a relatively substantial 2.9 percent increase in nonagricultural wage and salary employment from 1209.2 thousand in 1978 to 1244.7 thousand in 1979.[25] However, manufacturing employment decreased somewhat during the year and, otherwise, there were mixed gains and losses. The overall gain was the result of employment increases in particular nonmanufacturing industries.

Comparing the fourth quarter of 1978 to the fourth quarter of 1979, there was a decrease of more than 5.5 thousand jobs in durable manufacturing employment and of an almost negligible 200 jobs in nondurable manufacturing. Among the durable manufacturing industries, primary metals and electrical machinery each experienced a net gain. Lumber, furniture, fabricated metals, nonelectrical machinery, and transportation equipment all experienced losses. These losses were more than 2 thousand in the case of transportation equipment, nearly 2 thousand in fabricated metals, and from 400 to more than a thousand in each of the other identified categories. Stone, clay and glass and other durable goods were the only categories that experienced essentially unchanged employment. Among the nondurable manufacturing industries, printing and publishing, apparel, and chemicals were the only two digit industries to experience an employment increase during the year. Food, paper, and petroleum, coal and plastic products were essentially unchanged. Tobacco, textile mill products, and leather each recorded employment decreases; tobacco experienced an employment decline of more

than a thousand, textile mills more than 600, and leather 400.

Similarly, among the nonmanufacturing industries, coal mining, contract construction, and wholesale and retail trade each experienced a decline in employment between the fourth quarter of 1978 and the fourth quarter of 1979. The greatest decline was in contract construction, which lost more than 2.5 thousand jobs, but coal mining and trade each lost more than 2 thousand, with the trade loss more or less evenly divided between wholesale and retail. However, it is significant that in both coal mining and in trade, the greatest loss came in the first quarter of 1979; in each of these industries, employment increased each quarter during 1979.[26] In contrast, contract construction employment peaked in the late summer of 1979, falling off during the last four months of the year, a circumstance that reflected tightening monetary conditions as well as normal seasonal variation.

The nonmanufacturing industries that gained employment were finance, insurance, and real estate; government; the regulated industries; and services. Of these, government and services each increased employment by more than 10 thousand. The greatest government gain was in state and local education employment, with a gain of approximately 9 thousand; however, each major category of civilian government employment showed some increase. Finance, insurance, and real estate, and the regulated industries each increased by more than a thousand, with each of the regulated industries—transportation, communications, and public utilities—experiencing some gain. Generally, the pattern in those industries that gained employment was of an increase in each quarter of the year.

The performance of the Kentucky economy in 1979 was affected by the nationwide weakened demand for domestically produced automobiles and other motor vehicles and, late in the year, by the effects of rising interest rates and generally tightening monetary conditions. Housing and motor vehicles, including motor vehicle parts, explain much of the employment weakness in the Kentucky economy during 1979, just as they explain important characteristics of the performance of the United States economy in that year. Furthermore, in most cases, what is not accounted for by housing and motor vehicles, such as possibly the decline in coal mining employment, can be explained by various other special circumstances, such as the conditions in the domestic steel industry and federal legislation and regulations.

This analysis is confirmed by other considerations than simply the employment behavior of the Kentucky economy. Between the fourth quarter of 1978 and the fourth quarter of 1979, there was a decline of more than 9 percent in coal production in eastern Kentucky, notwithstanding milder weather conditions in 1979. Between these quarters, in Kentucky, the value of residential and nonresidential construction contracts fell by almost 30 percent. New passenger car registrations in Kentucky decreased by 12.7 percent; in contrast, sales and use taxes increased by nearly 30 percent and state income tax receipts by almost 35 percent.[27] Gasoline tax receipts declined by more than 11 percent. Excluding consumption by the U.S. Department of Energy,[28] kilowatt hour electricity sales to industrial and commercial users in Kentucky increased by 4.7 percent from the fourth quarter of 1978 to the fourth quarter of 1979. Finally, between these quarters, Kentucky farmers experienced an increase of nearly 10.5 percent in prices for their produce, as measured by the Index of Prices Received by Kentucky Farmers, an index constructed by the KCEA staff.[29] The evidence is of an economy that may have exhibited some particular areas of weakness in 1979, but performed relatively well overall.

## The Kentucky Economic Outlook, 1980-81

The implications for Kentucky of a national recession in 1980 are much the same as they would have been in 1979 had such an event occurred. The Kentucky economy remains vulnerable in a way it was not during the 1973-75 period. Then agriculture and mining provided a counterweight to manufacturing, lessening the effects of the recession in Kentucky. Now, however, neither of these industries is enjoying boom conditions. If a national economic recession occurs, it is likely to have as much effect in Kentucky as on the United States as a whole.

Economic forecasts are always made subject to various reservations, such as the absence of war and other major disasters. But in considering any forecasts made for a state economy, it is important to recognize also that the particular forecasts presented are crucially dependent upon the specific assumptions that are made about the performance of the national economy during the forecast period. Clearly, as a part of the national economy, a state economy will be affected by national economic conditions. However, in addition, specific circumstances may result in a greater or lesser effect in a given state, comparatively, than for the nation as a whole; for example, Michigan has been relatively more affected than Kentucky, or the country as a whole, by the consumer's switch in preferences from large domestic automobiles to small imports, and to gasoline efficient automobiles generally. Similarly, Kentucky is relatively much more affected than is Michigan by national economic conditions that affect the demand for coal.

The fact that national economic conditions may

imply differential effects in particular states has obvious implications for any consideration of the effects of federal government economic policies. The performance of the U.S. economy will depend to some degree upon the policies that have been and will be adopted by the government. However, it is important to take into account not only the general effects of these policies on the U.S. economy, but also the specific effects on industries that are important to Kentucky.

The recent acceleration in price inflation makes it likely that during at least 1980, the federal government will pursue both a restrictive monetary policy, leading to the continuation of high rates of interest, and a restrictive fiscal policy, with the possible exception of defense expenditures. The fiscal policy measures that will be adopted are likely to result in a reduction in the rate of growth in federal government expenditures, if not an outright decrease in the amount, in an attempt to reduce or even eliminate the federal government budgetary deficit; at least this will be true in the absence of a recession. Similarly, the monetary policies pursued by the Federal Reserve Board are likely to be designed to reduce the rate of growth in the money supply, thus leading to higher interest rates and tighter credit conditions.

It is not yet obvious exactly which federal government programs are likely to be reduced, especially in the context of an election year. As was true last year also, a candidate for reduction is federal grants-in-aid to states.[30] Of any possible changes in federal government expenditures policies, such a reduction would unquestionably have a direct effect in Kentucky both through a reduction in direct government expenditures in the state and through its general effects on the United States economy.

But in considering the effect of changes in government fiscal policies on Kentucky, it is not only federal government policies that need to be considered. State and local governments also affect the state economy through their tax and expenditure policies. In some cases, these policies could be adopted in order to affect the economy. In other cases, the adopted policies may have an unintentional impact. In addition, some state and local government expenditure changes may occur as a result of changes in federal government policies, as for example, in the case of the CETA program and other federally funded local area programs. Such programs may be begun as federal government policies, but once established they are properly considered in the context of state and local government policy decisions, especially as subsequent changes in the programs could be offset through changes in state and local government expenditures and taxes.

This year, as in past years, a quantitative assessment of the Kentucky economic outlook is provided by forecasts made using the Kentucky Quarterly Econometric Model. One of these forecasts, technically known as the "Control Forecast," presents a view of the future that is thought to be the one most likely to be realized in the absence of a fundamental change in federal government economic policies.[31] This forecast corresponds to the national forecast presented in Chapter I labeled "Control Forecast."

The alternative forecast for Kentucky is also made using the Kentucky Quarterly Model. However, it is based upon a national forecast made by Wharton Econometric Forecasting Associates, Inc. that assumes a two quarter decline in real Gross National Product. This alternative Kentucky forecast differs from the Kentucky "Control" forecast only in the assumptions made about the performance of the national economy. Therefore a comparison of the two Kentucky forecasts provides an indication of the effect of a mild national recession on the Kentucky economy.

## The Kentucky Quarterly Model Control Forecast 1980-81

The Kentucky Quarterly Model control forecast is presented in detail in Appendix Tables A-1 through A-4. As mentioned earlier, this state forecast corresponds to the National Control Forecast presented in Chapter I, which was made by the author using the Wharton Mark IV Quarterly Econometric Model of the United States.

The Kentucky Control Forecast has two characteristics that should be noted immediately. The first is that for 1979, as well as for 1980 and 1981, all of the numbers in the tables are *forecasts.* Some data are available on the performance of the Kentucky economy during 1979, but not a sufficient amount to allow this year to be taken as given. As a result, it has been necessary to begin the forecast period with the first quarter of 1979, taking account of those observations on economic variables that are already available, although none are used directly in the forecasts. Thus, even though the only quarterly numbers shown in Appendix Tables A-1 through A-4 are those for 1980 and 1981, the forecasts were actually made for the entire period from the first quarter of 1979 through the fourth quarter of 1981.

The second characteristic of the tables is that the figures shown for the labor force, total employment, unemployment, and the unemployment rate are not exactly comparable in concept with those published by the Kentucky Department for Human Resources. The Department for Human Resources is required to construct their estimates in accordance with a standard methodology laid down by the Bureau of Labor Statistics, U.S. Department of Labor. This methodology involves the use of the Current Population Survey, U.S.

Bureau of the Census, to arrive at estimates for these quantities that are independent of the employment results for the individual industries.[32] In contrast, the Kentucky model forecasts are made by summing the forecasted industry employment figures and then adjusting for net out-of-state commuting by Kentucky residents.

The Kentucky Control Forecast is based upon the optimistic assumption that the U.S. economy will perform sluggishly in 1980, and perhaps even experience a quarter during which real GNP declines, but will not go into recession.[33] Residential construction is expected to be weak in the face of a tight monetary policy, with the rate of housing starts dropping to as low as 1.0 to 1.2 million units. Demand for the standard American automobile is expected to be weak, although demand for gasoline efficient automobiles is expected to be strong. However, while short term interest rates, including the prime rate, are assumed to remain at double digit levels during most, if not all of 1980, it is assumed that there will be no credit crunch; money is assumed to be generally available to businesses and consumers, even if at a high price. Most importantly, this Kentucky forecast assumes that the consumer will not "retrench" during 1980, despite the low savings rate and the high inflation rate.

Given these national economic conditions, the Kentucky Control Forecast suggests some degree of weakness in the performance of the Kentucky economy during 1980, but nevertheless a continued overall expansion. Kentucky personal income is forecasted to continue to increase at a rate in excess of 10 percent in both 1980 and 1981. However, as indicated in annual summary form in Table 5, the forecasted nominal personal income growth of approximately 10.5 percent in 1980 corresponds to very weak real personal income growth of less than 1 percent. Manufacturing employment growth is projected to be negligible, if not negative, comparing 1979 and 1980. The unemployment rate is projected to increase from an average of approximately 5.7 percent in 1979 to 6.1 percent in 1980, before dropping back to 6.0 percent in 1981. Note also the very weak performance of nonagricultural wage and salary employment during the 1979-80 period.

There are four Kentucky industries, in particular, that are likely to be most affected by the weaker performance of the national economy. Manufacturing will be affected both because of the declining rate of housing starts nationally and the weak demand for standard sized domestically produced automobiles; as noted earlier, the manufacture of automotive parts has become an increasingly more important manufacturing

TABLE 5

KENTUCKY QUARTERLY ECONOMETRIC MODEL CONTROL FORECAST
ANNUAL SUMMARY TABLE
SELECTED ECONOMIC INDICATORS

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Personal Income (Millions) | 26208.0 | 28934.4 | 31856.5 |
| % Chg.: Ky. Personal Income | 13.39 | 10.40 | 10.10 |
| Real Personal Income (Millions 1972 $) | 16042.2 | 16158.8 | 16476.4 |
| % Chg.: Ky. Real Personal Income | 4.10 | 0.73 | 1.97 |
| Wage and Salary Disbursement | 15818.5 | 17429.7 | 19271.9 |
| Mfg. Wage & Salaries | 4669.8 | 5144.8 | 5680.5 |
| Non-Mfg. Wage & Salaries | 11148.8 | 12284.9 | 13591.3 |
| Total Employment (Thousands) | 1478.0 | 1487.7 | 1524.2 |
| Non-Agri. Wage & Salary Employment | 1240.5 | 1241.6 | 1265.7 |
| % Chg.: Ky. Non-Agri. Empl. | 2.59 | 0.09 | 1.94 |
| Manufacturing Employment | 294.4 | 294.2 | 299.4 |
| Durable Goods | 169.3 | 169.4 | 173.9 |
| Non-Durable Goods | 125.1 | 124.7 | 125.6 |
| Non-Mfg., Non-Agri. Empl. | 946.1 | 947.5 | 966.2 |
| Civilian Labor Force (Thousands) | 1584.9 | 1602.2 | 1640.5 |
| Ky. Unemployment Rate (%) | 5.7 | 6.1 | 6.1 |

Forecast Date: March 15, 1980.

activity in Kentucky during the past ten years. Similarly, contract construction and finance, insurance and real estate will be directly affected by the current and expected tight monetary conditions. Finally, the coal industry is likely to exhibit some employment weakness in 1980, reflecting the various conditions discussed earlier.

It is almost self-evident that the combination of a high rate of inflation and restrictive federal government monetary and fiscal policies can be expected to have an effect on industries such as manufacturing and contract construction. However, it is important to take note also of the direct impact on the Kentucky economy of federal government economic policies. There are two aspects to consider: the possibility of a net reduction in federal government expenditures and the compositional shift towards defense expenditures and away from social services and other types of expenditures. While it is unlikely that nationally there will actually be a net reduction in expenditures, the effect on Kentucky of federal budgetary restraint and this type of compositional shift may be a reduced level of federal expenditures within the state. The National Control Forecast incorporates the assumption of some reduction in federal government grants-in-aid to states, but, in addition, the Kentucky Control Forecast assumes a mild reduction in federal government employment in Kentucky of approximately a thousand during the forecast period.

Policies of the federal government are not, however, the only ones that will have an effect on the Kentucky economy: the state government will also be pursuing an economic policy in 1980 that will be deflationary in some of its effects. The Brown Administration's stated policy is to reduce the level of general state government employment during the next two years through attrition, with the expectation of achieving an approximately 5 percent reduction. Reflecting this employment policy, the Control Forecast incorporates a fairly significant decline in noneducational state and local government employment, combined with some net decline in educational employment. However, the employment declines are assumed to reflect the combined effect of the Brown Administration's policy and some local government reduction because of the assumed cuts in federal government disbursements to states.

At the same time, the Governor has sought and received bonding authority to embark upon a developmental program that includes a road improvement plan, under the Economic Development Roads bill. The total program for the biennium is $346 million, of which $216 million is scheduled to be spent in 1980-81 and $129 million in 1981-82.[34]

Clearly, this development program will be economically stimulative, but it is difficult to be more than tentative in defining the timing of the impact in terms of assigning it to 1980 and 1981, each of the years for which forecasts are now being made. Given both the level of bond interest rates now and the time it will take to arrange for the sale of the bonds, it is unlikely that much, if any, of the $346 million will be spent in 1980. For the purposes of this forecast, the bulk of these monies—$250 million—is assumed to be spent or committed in calendar year 1981 with the remainder assigned to 1982. Part of the effect of this development program can be seen in the employment rebound in contract construction and some of the general, non-manufacturing employment increase that the model forecast indicates for 1981.

Generally, the Kentucky Control Forecast suggests that the Kentucky economy will experience net growth during the next two years. However, in interpreting

TABLE 6

KENTUCKY QUARTERLY ECONOMETRIC MODEL CONTROL FORECAST
KENTUCKY PERSONAL INCOME

| Description | 1978 | 1979 | 1980 | 1981 |
|---|---|---|---|---|
| Kentucky Personal Income (Millions) | 23105.0 | 26208.0 | 28934.4 | 31856.5 |
| Percent Change | 11.73 | 13.43 | 10.40 | 10.10 |
| Kentucky Per Capita Personal Income | 6605.0 | 7342.9 | 8030.6 | 8760.2 |
| Percent Change | 10.75 | 11.16 | 9.02 | 9.09 |
| Kentucky Real Personal Income (Millions) | 15403.0 | 16042.2 | 16158.8 | 16476.4 |
| Percent Change | 4.58 | 4.15 | 0.73 | 1.97 |
| Kentucky Real Per Capita Personal Income | 4405.2 | 4508.7 | 4484.8 | 4530.8 |
| Percent Change | 2.73 | 2.35 | -0.53 | 1.03 |

Forecast Date: March 15, 1980.

this forecast, it is important to bear in mind not only the total performance of the economy, but also its performance on a per capita basis. The figures for real personal income and its rate of change illustrate that the income growth during the period is to some degree illusionary, but it is also instructive to compare, as does Table 6, total and per capita nominal and real income growth.

## Alternative Forecast: Two Quarter Real GNP Decline

This alternative forecast for Kentucky is based upon the assumption of a two-quarter decline in real GNP during the first half of 1980, followed by a sluggish recovery in which federal defense expenditures represent the principal area of rapid growth. The forecast assumptions include predictions of the values of national variables taken from the January 28, 1980 *Pre-Meeting Control Forecast* made by Wharton Econometric Forecasting Associates using the Wharton Mark V Quarterly Econometric Model of the United States. However, while this Kentucky forecast is based upon a different set of national assumptions than the Kentucky Control Forecast presented earlier, both Kentucky forecasts are based upon essentially the same assumptions otherwise. It should also be noted that this Kentucky alternative is an update of the state forecast presented in the March 1980 issue of *Kentucky Economy: Review and Perspective,* the principal difference being that the present forecast incorporates an adjustment for the 1979 employment benchmark revisions made recently by the Kentucky Department for Human Resources.

As discussed in Chapter I, the Wharton national forecast that stands behind this Kentucky forecast is based upon the presumption of continued tight monetary policies and no tax cut in 1980. The likely impact of this national scenario on Kentucky is shown in Table 7 and Appendix Tables A-5 through A-7 to include a three-quarter decline in Kentucky nonagricultural wage and salary employment, beginning in the second quarter of 1980. Only at the beginning of 1981 is a recovery in this type of employment projected to begin. Year to year, the forecast suggests a slight, temporary decline in coal mining employment, but a significant decline in 1980 in both manufacturing and contract construction employment. On a year to year basis, neither manufacturing nor contract construction completely regains the

TABLE 7

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATE FORECAST: TWO QUARTER DECLINE
IN REAL GROSS NATIONAL PRODUCT
ANNUAL SUMMARY TABLE
SELECTED ECONOMIC INDICATORS

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Personal Income (Millions) | 26002.2 | 28401.0 | 31245.0 |
| % Chg.: Ky. Personal Income | 12.50 | 9.23 | 10.01 |
| Real Personal Income (Millions 1972 $) | 15916.4 | 15863.1 | 16159.4 |
| % Chg.: Ky. Real Personal Income | 3.29 | -0.34 | 1.87 |
| Wage and Salary Disbursement | 15622.4 | 16937.4 | 18707.8 |
| Mfg. Wage & Salaries | 4669.7 | 4895.3 | 5400.1 |
| Non-Mfg. Wage & Salaries | 10952.7 | 12042.1 | 13307.7 |
| Total Employment (Thousands) | 1478.0 | 1471.2 | 1496.1 |
| Non-Agri. Wage & Salary Empl. | 1240.3 | 1230.8 | 1246.6 |
| % Chg.: Ky. Non-Agri. Empl. | 2.57 | -0.77 | 1.29 |
| Manufacturing Employment | 294.4 | 283.2 | 289.3 |
| Durable Goods | 169.3 | 157.1 | 160.0 |
| Non-Durable Goods | 125.1 | 126.0 | 129.3 |
| Non-Mfg., Non-Agri. Empl. | 945.9 | 947.6 | 957.3 |
| Civilian Labor Force (Thousands) | 1584.8 | 1586.4 | 1614.0 |
| Ky. Unemployment Rate (%) | 5.7 | 6.2 | 6.3 |

Forecast Date: February 22, 1980.

1979 level, although on a quarterly basis there is continued growth in nondurable manufacturing. It is easily imagined that the effects on Kentucky employment of a mild national recession in 1980 would be almost completely effaced by the middle of 1982.

The relative effect on the Kentucky economy of the national economy's performance in 1980 and 1981, as it is portrayed by the Wharton January 28 alternative national forecast compared to the national Control Forecast is shown in Tables 8 and 9. These tables respectively indicate the effect of a mild national recession on the state in terms of differences and percentage changes. Thus, for example, Table 8 indicates that in the first quarter of 1980, a recessionary U.S. economy would cause a decline of approximately $274 million in Kentucky Personal Income. In Table 9, this decline is shown to represent nearly a 1.0 percent decline. It will be seen, in comparing the two Kentucky forecasts using these tables, that the greatest effect of the mild national recession occurs at the end of 1980. These tables illustrate the tax revenue effects at both the federal and state levels, as well as the aggregate effects that could be computed from the Appendix forecast tables.[35]

## March 14 Economic Policy Announcement

The economic policies announced by President Carter on March 14, 1980 have not been taken into account in the above analysis of the economic outlook for Kentucky. However, these policies are recessionary in character, so that with them in effect, the question is no longer whether or not there will be a decline in the level of economic activity; instead, it is the degree and the duration of the decline. Only to the extent that the monetary and fiscal policies announced on March 14 are not put into force and maintained is there any possibility that the economy could continue to grow, even sluggishly, during the next two or three quarters.

In fact, as discussed in the outlook analysis for Chapter I, it is unlikely that the entire policy package will be implemented. The proposal to introduce a withholdings tax on interest and dividends now appears unlikely to obtain sufficient congressional support. It is also improbable that it will be possible to reduce federal expenditures by the $13 billion proposed by President Carter. The proposal to reduce grants-in-aid to states will not be very attractive to senators and congressmen running for election, especially as the effects of the credit restrictions and of the ultra-tight monetary policies begin to be evident. However, in addition to the problems involved in making spending cuts in an election year, the inflation in prices will tend to raise the costs of various federal government programs, thus limiting the net reduction possible. Furthermore, to the extent that the new austerity policies begin to have a recessionary impact, unemployment insurance and other social welfare expenditures will begin to rise automatically.

In order to gauge the effect in Kentucky of the March 14 policies, an additional forecast has been made with the Kentucky Quarterly Econometric Model. This Kentucky forecast is based upon the latest forecast of the Wharton Econometric Forecasting Associates, made on March 28, 1980 using the Mark V Wharton Quarterly Econometric Model of the United States. This Wharton forecast takes into consideration the several circumstances just mentioned. It assumes that the proposed withholding tax on interest and dividends will not be enacted. It assumes that inflation will limit the possible government expenditure cuts. However, it also assumes that the oil import fee will be imposed and that the credit restriction policies of the Federal Reserve Board will be maintained. These policies essentially consist of the increase in the discount rate, the increased reserve requirements against managed liabilities, and the 15.0 percent set aside against unsecured credit in excess of March 14 levels.[36]

The resulting Wharton forecast is for a recession beginning the second quarter of 1980 and lasting throughout the rest of the year. Real GNP is projected to decline peak to trough by 0.9 percent, and the recovery in 1981 is expected to be "very gradual" with a real GNP increase of only 1.9 percent between the fourth quarter of 1980 and the fourth quarter of 1981. This Wharton forecast also includes the prediction of a higher unemployment rate, an average of 6.8 percent in 1980 and 7.8 percent in 1981. However, inflation is predicted to decrease over the forecast period, with the Consumer Price Index rising by 13.6 percent in 1980 but decreasing to a rate of 10.2 percent in 1981.

The Kentucky forecast that corresponds to this national scenario is shown in annual summary form in Table 10 and in more detail in Appendix Table A-8. The result is a projected 1.52 percent decline in Kentucky nonagricultural wage and salary employment in 1980 over 1979 and a further decline of almost 1.0 percent in 1981. This continued employment decline in 1981 reflects, as much as anything else, the impact on Kentucky of the tight credit restrictions, which will affect the purchase of both auto and nonautomobile consumer durables. This forecast also shows less growth in both nominal and real personal income, and a higher unemployment rate in both 1980 and 1981.

Some indication of the relative effect of this alternative forecast is provided by Tables 11 and 12, which compare the Kentucky Control Forecast to this alternative. These tables can also be compared to Tables 8 and 9 in order to determine the difference between the two alternative forecasts. It is evident from Tables 8, 9, 11,

TABLE 8

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF MILD NATIONAL RECESSION
(Differences)

| Description | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 |
|---|---|---|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | -273.984 | -457.691 | -641.031 | -760.953 | -704.320 | -600.734 | -575.910 | -564.965 |
| Kentucky Real Personal Income (Millions) | -157.828 | -258.145 | -354.555 | -412.441 | -374.242 | -313.539 | -295.336 | -284.762 |
| Disposable Personal Income (Millions) | -206.855 | -341.227 | -473.598 | -569.297 | -539.914 | -479.707 | -472.258 | -466.730 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | -67.129 | -116.462 | -167.434 | -191.655 | -164.407 | -121.027 | -103.652 | -98.234 |
| State Tax and Non-Tax Payments (Millions) | -13.456 | -22.883 | -32.583 | -38.393 | -34.683 | -27.966 | -25.698 | -24.656 |
| Federal Tax and Non-Tax Payments (Millions) | -45.596 | -80.066 | -115.856 | -130.722 | -108.647 | -74.926 | -60.400 | -56.280 |
| Total Employment (Thousands) | -5.180 | -14.101 | -20.609 | -26.449 | -30.844 | -29.019 | -27.009 | -25.681 |
| Non-Agricultural Wage and Salary Employment (Thousands) | -1.826 | -8.643 | -14.005 | -18.892 | -22.570 | -20.182 | -17.545 | -15.838 |
| Civilian Labor Force, NRA (Thousands) | -4.995 | -13.673 | -19.624 | -24.875 | -28.881 | -26.996 | -25.430 | -24.770 |
| Kentucky Unemployment Rate (Percent) | 0.030 | 0.079 | 0.138 | 0.196 | 0.235 | 0.228 | 0.191 | 0.146 |

Comparison of Kentucky Control Forecast of March 15, 1980 and Kentucky Alternative Forecast of February 29, 1980.



TABLE 9

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF MILD NATIONAL RECESSION
(Percent Change)

| Description | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 |
|---|---|---|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | -0.988 | -1.631 | -2.242 | -2.604 | -2.360 | -1.956 | -1.813 | -1.730 |
| Kentucky Real Personal Income (Millions) | -0.988 | -1.631 | -2.242 | -2.604 | -2.360 | -1.956 | -1.813 | -1.730 |
| Disposable Personal Income (Millions) | -0.860 | -1.404 | -1.909 | -2.247 | -2.092 | -1.810 | -1.725 | -1.661 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | -1.827 | -3.095 | -4.432 | -4.926 | -4.077 | -2.881 | -2.361 | -2.153 |
| State Tax and Non-Tax Payments (Millions) | -1.552 | -2.556 | -3.558 | -4.055 | -3.539 | -2.749 | -2.418 | -2.225 |
| Federal Tax and Non-Tax Payments (Millions) | -1.980 | -3.402 | -4.955 | -5.437 | -4.353 | -2.876 | -2.219 | -1.993 |
| Total Employment (Thousands) | -0.350 | -0.958 | -1.403 | -1.805 | -2.095 | -1.949 | -1.793 | -1.692 |
| Non-Agricultural Wage and Salary Employment (Thousands) | -0.147 | -0.701 | -1.141 | -1.545 | -1.838 | -1.627 | -1.398 | -1.254 |
| Civilian Labor Force, NRA (Thousands) | -0.317 | -0.871 | -1.252 | -1.589 | -1.835 | -1.698 | -1.583 | -1.532 |
| Kentucky Unemployment Rate (Percent) | 0.506 | 1.289 | 2.203 | 3.087 | 3.680 | 3.608 | 3.084 | 2.395 |

Comparison of Kentucky Control Forecast of March 15, 1980 and Kentucky Alternative Forecast of February 29, 1980.

TABLE 10

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: EFFECT OF ECONOMIC POLICIES
ANNOUNCED MARCH 14, 1980
ANNUAL SUMMARY TABLE
SELECTED ECONOMIC INDICATORS

| Description | 1979 | 1980 | 1981 |
|---|---|---|---|
| Personal Income (Millions) | 26208.0 | 28638.3 | 31155.4 |
| % Chg.: Ky. Personal Income | 13.39 | 9.27 | 8.79 |
| Real Personal Income (Millions 1972 $) | 16042.2 | 15974.0 | 16073.6 |
| % Chg.: Ky. Real Personal Income | 4.10 | -0.43 | 0.62 |
| Wage and Salary Disbursement | 15818.5 | 17151.3 | 18451.8 |
| Mfg. Wage & Salaries | 4669.8 | 5013.7 | 5439.7 |
| Non-Mfg. Wage & Salaries | 11148.8 | 12137.6 | 13012.1 |
| Total Employment (Thousands) | 1478.0 | 1468.3 | 1473.5 |
| Non-Agri. Wage & Salary Employment | 1240.5 | 1221.7 | 1210.6 |
| % Chg.: Ky. Non-Agri. Employment | 2.59 | -1.52 | -0.92 |
| Manufacturing Employment | 294.4 | 267.3 | 284.9 |
| Durable Goods | 169.3 | 158.9 | 150.5 |
| Non-Durable Goods | 125.1 | 128.4 | 134.3 |
| Non-Mfg., Non-Agri. Employment | 946.1 | 934.5 | 925.7 |
| Civilian Labor Force (Thousands) | 1584.9 | 1583.8 | 1593.2 |
| Ky. Unemployment Rate (%) | 5.7 | 6.2 | 6.4 |

Forecast Date: March 30, 1980.

and 12, that the March 28 Wharton forecast implies a somewhat more severe economic decline for Kentucky. Furthermore, comparing the January 28 to the March 28 Wharton forecast, the pattern of the decline changes, with the effect progressively larger in 1981 and less in 1980. To the extent that the causes can be isolated, it appears that the principal reason the latest Wharton forecast (in conjunction with the Kentucky Quarterly Model) implies a more severe effect in Kentucky is the set of national monetary policy assumptions that stand behind it. Comparing the January 28 and March 28 Wharton forecast tables, presented in the Appendix to Chapter I, it is obvious that the March 28 forecast assumes higher interest rates and, furthermore, that a higher level of interest rates continue to prevail in 1981. The Kentucky Quarterly Model interprets these higher interest rates to mean that there will be a rather long, drawn-out period of low rates of residential construction, and rather soft demand for consumer durables.

Of course, as was argued in the outlook analysis section of Chapter I, it is questionable whether this type of national scenario is realistic. This Kentucky forecast, therefore, must be interpreted as simply suggesting the likely impact on Kentucky if the national economy were to behave in the manner indicated by the March 28 Wharton forecast.

Footnotes

[1] Estimates of Personal Income for the state of Kentucky, its counties and SMSAs are made by the Regional Economic Measurement Division of the Bureau of Economic Analysis, U.S. Department of Commerce. These data are available on line on the state government and the Kentucky Educational Computing Networks (KECNET) from the Kentucky Economic Information System. The concept of Personal Income is described in Charles G. Renfro and Paul A. Coomes, *The Kentucky Economic Information System User Manual*, Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, for the Kentucky Council of Economic Advisors, 1977, Section 2.3.

[2] Real per capita Personal Income is computed by first deflating Personal Income using the U.S. Personal Consumption Expenditures Deflator to obtain real Personal Income and then dividing that by the estimated population of Kentucky. The population estimates used are obtained from the Urban Studies Center, University of Louisville.

[3] The reason that these figures are the same in either case is that the U.S. Personal Consumption Expenditures Deflator is used to obtain real per capita Personal Income in Kentucky. This is the same deflator used by the Bureau of Economic Analysis, U.S. Department of Commerce to obtain the estimate of U.S. real per capita Personal Income, so that this term appears both in the numerator and the denominator of the ratio and therefore cancels.

[4] In the short time since this article was written, the estimates for 1979 have been revised. The Kentucky Department for Human Resources now estimates nonagricultural wage and salary

TABLE 11

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF POLICY INDUCED NATIONAL RECESSION
(Differences)

| Description | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 |
|---|---|---|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | -298.414 | -265.816 | -258.809 | -361.500 | -473.148 | -653.293 | -820.666 | -857.809 |
| Kentucky Real Personal Income (Millions) | -162.703 | -149.922 | -187.340 | -239.332 | -285.301 | -374.305 | -461.887 | -489.719 |
| Disposable Personal Income (Millions) | -232.711 | -187.137 | -170.137 | -247.746 | -331.309 | -461.758 | -571.383 | -601.766 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | -65.703 | -78.679 | -88.672 | -113.753 | -141.842 | -191.535 | -248.684 | -256.043 |
| State Tax and Non-Tax Payments (Millions) | -25.435 | -31.248 | -30.772 | -32.623 | -34.686 | -41.022 | -50.443 | -52.129 |
| Federal Tax and Non-Tax Payments (Millions) | -33.045 | -39.704 | -49.362 | -69.290 | -91.614 | -128.855 | -170.215 | -173.856 |
| Total Employment (Thousands) | -8.289 | -14.608 | -23.358 | -31.454 | -40.604 | -50.892 | -57.539 | -53.625 |
| Non-Agricultural Wage and Salary Employment (Thousands) | -8.294 | -14.948 | -23.907 | -32.320 | -42.317 | -54.079 | -62.987 | -61.045 |
| Civilian Labor Force, NRA (Thousands) | -8.076 | -14.011 | -22.176 | -29.516 | -38.026 | -47.725 | -53.794 | -49.507 |
| Kentucky Unemployment Rate (Percent) | 0.044 | 0.091 | 0.161 | 0.238 | 0.311 | 0.383 | 0.437 | 0.439 |

Comparison of Kentucky Control Forecast of March 15, 1980 and Kentucky Alternative Forecast of March 30, 1980.



TABLE 12

KENTUCKY QUARTERLY ECONOMETRIC MODEL
COMPARISON OF FORECASTS
EFFECT OF POLICY INDUCED NATIONAL RECESSION
(Percent Change)

| Description | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 |
|---|---|---|---|---|---|---|---|---|
| Kentucky Personal Income (Millions) | -1.077 | -0.941 | -0.893 | -1.220 | -1.573 | -2.131 | -2.602 | -2.650 |
| Kentucky Real Personal Income (Millions) | -1.019 | -0.941 | -1.172 | -1.495 | -1.789 | -2.344 | -2.865 | -3.012 |
| Disposable Personal Income (Millions) | -0.969 | -0.765 | -0.677 | -0.966 | -1.273 | -1.741 | -2.095 | -2.152 |
| Total Tax and Non-Tax Payments, Kentucky (Millions) | -1.787 | -2.070 | -2.299 | -2.866 | -3.498 | -4.637 | -5.858 | -5.813 |
| State Tax and Non-Tax Payments (Millions) | -2.975 | -3.523 | -3.354 | -3.425 | -3.540 | -4.085 | -4.860 | -4.824 |
| Federal Tax and Non-Tax Payments (Millions) | -1.428 | -1.658 | -2.053 | -2.810 | -3.645 | -5.051 | -6.517 | -6.423 |
| Total Employment (Thousands) | -0.562 | -0.993 | -1.594 | -2.154 | -2.777 | -3.470 | -3.899 | -3.600 |
| Non-Agricultural Wage and Salary Employment (Thousands) | -0.673 | -1.219 | -1.963 | -2.672 | -3.502 | -4.481 | -5.208 | -5.014 |
| Civilian Labor Force, NRA (Thousands) | -0.514 | -0.893 | -1.417 | -1.891 | -2.430 | -3.041 | -3.408 | -3.109 |

Comparison of Kentucky Control Forecast of March 15, 1980 and Kentucky Alternative Forecast of March 30, 1980.

employment in Kentucky to have been 1,245 thousand in 1979, which is an increase of just over 39 percent since 1969.

[5]These estimates of manufacturing employment as a percent of population should be regarded as tentative, pending the results of the 1980 census. In fact, it is likely that the current estimates of the U.S. population will be revised upwards as a result of the census and that the difference between Kentucky and the U.S. will be found to be less than the difference implied by the figures 8.3 and 9.5, respectively.

[6]A detailed description of the agricultural products of Kentucky can be found in Milton Shuffett, "Agriculture in Kentucky–Situation, Recent Trends, and Projected Development," *Kentucky Council of Economic Advisors Annual Report, 1980*, Chapter VI.

[7]The Kentucky coal industry is described in some detail in Arthur F. Nicholson, "Coal in Kentucky–Situation, Recent Trends, and Projected Development," *Kentucky Council of Economic Advisors Annual Report, 1980*, Chapter VII. See also Curtis E. Harvey, *The Economics of Kentucky Coal* (Lexington, Ky.: The University Press of Kentucky, 1977).

[8]For a more detailed description of the effects of the last recession on Kentucky, see Charles Renfro, "The Kentucky Economic Situation," *Kentucky Council of Economic Advisors Annual Report, 1977* (Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, 1977), pp. 23-33 and earlier issues.

[9]It should be noted, incidentally, that the prosperity of the coal industry in particular, was then widely regarded as at the beginning of a fairly steady expansion in production. Consequently, the effects of the "coal boom" of 1974-76 were felt rather strongly throughout at least the coal producing areas of Kentucky. It was not only the then current prosperity of the industry, but also its expected future prosperity that helped to offset the effects of recession in Kentucky.

[10]Nonagricultural wage and salary employment includes wage and salary employment in mining; contract construction; wholesale and retail trade; services; finance, insurance and real estate; transportation, communications, and public utilities; civilian government; and manufacturing.

[11]This analysis is based upon and is an extension of earlier work done jointly with Paul Coomes. See Charles G. Renfro and Paul A. Coomes, "The Kentucky Economic Situation," *Kentucky Council of Economic Advisors Annual Report, 1979* (Lexington, Ky.. Office for Research, College of Business and Economics, University of Kentucky, 1979), pp. 21-41. See also Paul A. Coomes, "Kentucky Economic Outlook," *Kentucky Economy: Review and Perspective*, Vol. 3, No. 1, March 1979, pp. 4-5.

[12]Three minor exceptions to this statement are the Kentucky leather products and the U.S. paper products and miscellaneous durable goods industries.

[13]Of course, in considering the level of production in 1977, account must be taken of the fact that a coal strike was expected (and occurred) in the late autumn and winter of 1977-78. Some of the coal that would otherwise have been produced in 1978 was produced in 1977. Except for the strike and its effects, it is possible that the peak production year would have been 1976.

[14]The materials shortage in 1973-74 is documented in a series of committee reports on materials shortages by the U.S. Senate Committee on Government Operations in 1974. For a brief retrospective view see, "New Estimates of Capacity Utilization: Manufacturing and Materials," *Federal Reserve Bulletin*, November 1976, pp. 892-905.

[15]Of course, in the future, this switch will occur because of legislation and government regulation, as well as price effects. See, for example, U.S. Department of Energy, *The National Energy Act* (Washington, D.C.: Office for Public Affairs, 1978).

[16]Shuffett, op. cit.

[17]See Lawrence K. Lynch, "Kentucky's Economy: How Does It Compare?" *Kentucky Council of Economic Advisors Annual Report, 1979* (Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, 1979); Stephen E. Lile, "Kentucky Taxes: How Do They Compare?" *Kentucky Council of Economic Advisors Annual Report, 1979* (Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, 1979); Don M. Soule, "Is Kentucky a Low-Tax or a High-Tax State?" *Kentucky Council of Economic Advisors Annual Report, 1979* (Lexington, Ky.: Office for Research, College of Business and Economics, University of Kentucky, 1979), pp. 75-79.

[18]See U.S. Bureau of the Census, *County Business Patterns: Kentucky* (Washington, D.C.: U.S. Government Printing Office, 1970-79); E Evan Brunson, "The Rural Perspective," a paper presented at the annual Kentucky Economic Association Meeting, Louisville, October 26, 1979. To be published in the *Proceedings* of the meeting, forthcoming 1980.

[19]U.S. Bureau of the Census, *1972 Census of Retail Trade: Kentucky* (Washington, D.C.: U.S. Government Printing Office, 1975); U.S. Bureau of the Census, *1967 Census of Retail Trade: Kentucky* (Washington, D.C.: U.S. Government Printing Office, 1970).

[20]Aggregate data, by categories, is published yearly in the *Kentucky Department of Revenue Annual Report* (Frankfort: Ky.: Kentucky Department of Revenue).

[21]Lynch, op. cit.

[22]See also the essays in E. Blaine Liner and Lawrence K. Lynch, *The Economics of Southern Growth* (Research Triangle Park, N.C.: Southern Growth Policies Board, 1977).

[23]This point is discussed in some detail in Charles Renfro, "The Kentucky Economic Situation," *Kentucky Council of Economic Advisors Annual Report, 1977* (Lexington, Ky: Office for Research, College of Business and Economics, University of Kentucky, 1977), especially pp. 23-26.

[24]This estimate of Kentucky Personal Income is made using the Kentucky Quarterly Econometric Model, in conjunction with the available data on employment, wages and other data on economic activity in Kentucky during 1979. The most recent description of the Kentucky Quarterly Econometric Model can be found in Charles G. Renfro, "The Kentucky Quarterly Econometric Model: Recent Developments," *Proceedings of the Eleventh Annual Pittsburgh Conference on Modeling and Simulation* (Research Triangle Park, N.C.: Instrument Society of America, 1980), forthcoming.

[25]The figure 1244.7 differs from that shown in the Kentucky Quarterly Econometric Model forecast tables. This is because this figure is the latest estimate made by the Kentucky Department for Human Resources, while the figures shown in the forecast tables are all forecasts.

[26]The data referred to can be retrieved from the Kentucky Economic Information System Quarterly State Data Bank (QBANK). The data can be obtained in monthly form from the KEIS Monthly Bank (MBANK), or from the Kentucky Department for Human Resources.

[27]See the centerfold tables, "Selected Indicators of Economic Activity," *Kentucky Economy: Review and Perspective*, Vol. 4, No. 1, March 1980, pp. 6-7, for these data, which were drawn from the Kentucky Economic Information System.

[28]The U.S. Department of Energy operates the uranium enrichment plant in Paducah, which consumes large quantities of electricity. The relative amounts consumed by the Department of Energy and other industrial and commercial users are shown in "Selected Indicators of Economic Activity," the

centerfold section of each issue of *Kentucky Economy: Review and Perspective*, and the data are drawn from the Kentucky Economic Information System.

[29]This index is published each quarter in the section, "Selected Indicators of Economic Activity." *Kentucky Economy: Review and Perspective*. Originally constructed by Paul A. Coomes, the index is comparable to the national index of prices received by farmers for crops and livestock constructed by the U.S. Department of Agriculture.

[30]Renfro and Coomes, "The Kentucky Economic Situation," op. cit., especially pp. 26-33, concerned with the effect on Kentucky of a reduction in federal government grants-in-aid to states and local areas.

[31]At the national level, this is the proper interpretation of the "Control Forecast." However, at the state level, it may be more correct to say that the state control forecast is that one which is based upon the national control forecast, which is not necessarily the same as saying that the control forecast is the one most likely to be realized. Since this chapter was written, there has in fact been an important change in federal government policies. To gauge the effect of this change an addendum has been added to this chapter.

[32]Brian Motley, "The Unemployment Rate as an Economic Indicator at the State and Local Levels," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 3 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Mukhtar M. Ali, "CPS Estimate of the Unemployment Rate of the State of Kentucky," *Kentucky Council of Economic Advisors Policy Paper Series*, No. 4 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Brian Motley, "Unemployment and Labor Force Participation," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 5 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977); Brian Motley, "Estimating Unemployment Rates by County in Kentucky," *Kentucky Council of Economic Advisors Policy Papers Series*, No. 6 (Lexington, Ky.: Office for Research, University of Kentucky, September 1977).

[33]The corresponding national control forecast is presented in Chapter I. See the discussion of this national forecast there.

[34]These estimates have been made by the staff of the Kentucky Council of Economic Advisors with the assistance of Richard Sims of the Legislative Research Commission.

[35]Because of space constraints, the full set of forecast results of the Kentucky Quarterly Econometric Model are not presented in the forecast table. The current version of this 342 equation model is briefly described in Renfro, "The Kentucky Quarterly Econometric Model: Recent Developments," op.cit.

[36]Information concerning the March 14, 1980 economic policy announcement will be published in the March 1980, *Survey of Current Business*.

# APPENDIX

## KENTUCKY QUARTERLY ECONOMETRIC MODEL TABLES

TABLE A-1

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL FORECAST
SELECTED ECONOMIC INDICATORS

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Personal Income (Millions)[2] | 28000.3 | 28520.7 | 29230.2 | 29986.5 | 30548.9 | 31312.3 | 32340.7 | 33224.1 | 26208.0 | 28934.4 | 31856.5 |
| % Chg.: Ky. Personal Income | 10.25 | 7.64 | 10.33 | 10.76 | 7.72 | 10.38 | 13.80 | 11.38 | 13.39 | 10.40 | 10.10 |
| Real Personal Income (Millions 1972 $) | 16129.2 | 16086.1 | 16167.2 | 16252.8 | 16232.2 | 16342.5 | 16585.0 | 16746.0 | 16042.2 | 16158.8 | 16476.4 |
| % Chg.: Ky. Real Personal Income | -0.98 | -1.06 | 2.03 | 2.14 | -0.51 | 2.75 | 6.07 | 3.94 | 4.10 | 0.73 | 1.97 |
| Wage and Salary Disbursement | 16902.8 | 17232.9 | 17549.0 | 18034.1 | 18471.4 | 18938.4 | 19534.1 | 20143.5 | 15818.5 | 17429.7 | 19271.9 |
| Mfg. Wage & Salaries | 5082.4 | 5099.7 | 5106.5 | 5290.6 | 5506.5 | 5617.7 | 5735.3 | 5862.5 | 4669.8 | 5144.8 | 5680.5 |
| Non-Mfg. Wage & Salaries | 11820.4 | 12133.3 | 12442.4 | 12743.4 | 12964.9 | 13320.7 | 13798.8 | 14281.0 | 11148.8 | 12284.9 | 13591.3 |
| Total Employment (Thousands)[3,4] | 1484.2 | 1486.2 | 1489.1 | 1491.5 | 1503.0 | 1517.5 | 1533.1 | 1543.2 | 1478.0 | 1487.7 | 1524.2 |
| Non-Agri. Wage & Salary Employment | 1241.6 | 1241.2 | 1241.7 | 1242.0 | 1250.6 | 1261.0 | 1272.5 | 1278.6 | 1240.5 | 1241.6 | 1265.7 |
| % Chg.: Ky. Non-Agri. Empl. | 0.60 | -0.11 | 0.14 | 0.10 | 2.81 | 3.35 | 3.70 | 1.93 | 2.59 | 0.09 | 1.94 |
| Manufacturing Employment | 295.4 | 293.5 | 293.2 | 294.5 | 296.5 | 297.1 | 300.7 | 303.5 | 294.4 | 294.2 | 299.4 |
| Durable Goods | 169.7 | 169.1 | 168.7 | 170.1 | 171.8 | 172.3 | 174.7 | 176.6 | 169.3 | 169.4 | 173.9 |
| Non-Durable Goods | 125.7 | 124.4 | 124.5 | 124.4 | 124.7 | 124.8 | 126.0 | 126.8 | 125.1 | 124.7 | 125.6 |
| Non-Mfg., Non-Agri. Empl.[5] | 946.2 | 947.7 | 948.5 | 947.5 | 954.1 | 963.8 | 971.8 | 975.1 | 946.1 | 947.5 | 966.2 |
| Civilian Labor Force (Thousands)[6] | 1596.8 | 1600.2 | 1604.3 | 1607.6 | 1619.6 | 1634.2 | 1649.3 | 1658.7 | 1584.9 | 1602.2 | 1640.5 |
| Ky. Unemployment Rate (%)[7] | 6.0 | 6.1 | 6.1 | 6.2 | 6.2 | 6.1 | 6.0 | 5.9 | 5.7 | 6.1 | 6.1 |

Forecast Date: March 15, 1980. Forecast based on author's national forecast, made using the Wharton Mark IV Quarterly Econometric Model of the United States.

See Footnotes at end of Table A-8.

TABLE A-2

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL FORECAST
PERSONAL INCOME

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Personal Income (Millions)[2] | 28000.3 | 28520.7 | 29230.2 | 29986.5 | 30548.9 | 31312.3 | 32340.7 | 33224.1 | 26208.0 | 28934.4 | 31856.5 |
| Wage and Salary Disbursements | 16902.8 | 17232.9 | 17549.0 | 18034.1 | 18471.4 | 18938.4 | 19534.1 | 20143.5 | 15818.5 | 17429.7 | 19271.9 |
| Non-Agri. Wages & Salaries | 16765.1 | 17094.6 | 17412.4 | 17898.3 | 18328.9 | 18789.2 | 19386.2 | 19996.1 | 15703.6 | 17292.0 | 19125.1 |
| Manufacturing | 5082.4 | 5099.7 | 5106.5 | 5290.6 | 5506.5 | 5617.7 | 5735.3 | 5862.5 | 4669.8 | 5144.8 | 5680.5 |
| Durable Goods | 2952.8 | 2925.2 | 2957.0 | 3093.0 | 3293.0 | 3299.4 | 3374.2 | 3463.7 | 2709.2 | 2982.0 | 3357.6 |
| Non-Durable Goods | 2129.6 | 2174.5 | 2149.5 | 2197.6 | 2213.5 | 2318.3 | 2361.1 | 2398.9 | 1960.6 | 2162.8 | 2322.9 |
| Mining | 1157.1 | 1277.5 | 1306.2 | 1350.3 | 1394.2 | 1414.0 | 1448.1 | 1491.0 | 1083.5 | 1272.8 | 1436.8 |
| Coal Mining | 1081.9 | 1197.7 | 1224.5 | 1265.9 | 1306.9 | 1324.5 | 1355.8 | 1395.7 | 1012.8 | 1192.5 | 1345.7 |
| Other Mining | 75.3 | 79.8 | 81.8 | 84.4 | 87.3 | 89.6 | 92.2 | 95.3 | 70.7 | 80.3 | 91.1 |
| Contract Construction | 962.6 | 966.4 | 994.7 | 1039.6 | 978.2 | 1073.8 | 1234.0 | 1422.8 | 962.5 | 990.8 | 1177.2 |
| Regulated Industries | 1310.4 | 1328.0 | 1364.4 | 1391.1 | 1448.7 | 1460.9 | 1512.6 | 1562.3 | 1222.3 | 1348.5 | 1496.1 |
| Wholesale & Retail Trade | 2653.9 | 2712.5 | 2774.0 | 2830.0 | 2930.5 | 3019.4 | 3113.8 | 3204.1 | 2480.7 | 2742.6 | 3066.9 |
| Services | 2092.0 | 2169.6 | 2288.1 | 2370.6 | 2396.8 | 2490.2 | 2568.8 | 2634.5 | 1901.9 | 2230.1 | 2522.5 |
| Finance, Insurance & Real Estate | 604.2 | 606.8 | 617.4 | 627.4 | 659.5 | 661.9 | 681.4 | 686.2 | 556.4 | 614.0 | 672.3 |
| Government | 2902.5 | 2934.0 | 2961.0 | 2998.6 | 3014.6 | 3051.3 | 3092.2 | 3132.7 | 2826.4 | 2949.0 | 3072.7 |
| Civilian Government | 2387.5 | 2412.0 | 2435.0 | 2466.6 | 2470.6 | 2490.3 | 2510.2 | 2545.7 | 2323.7 | 2425.3 | 2504.2 |
| Federal Civilian | 649.0 | 655.3 | 661.8 | 679.8 | 673.5 | 680.4 | 684.4 | 702.8 | 627.1 | 661.5 | 685.3 |
| State & Local Government | 1738.5 | 1756.7 | 1773.2 | 1786.8 | 1797.1 | 1809.9 | 1825.8 | 1843.0 | 1696.6 | 1763.8 | 1819.0 |
| Federal Military | 515.0 | 522.0 | 526.0 | 532.0 | 544.0 | 561.0 | 582.0 | 587.0 | 502.8 | 523.8 | 568.5 |
| Agricultural Wage & Salary[8] | 137.7 | 138.3 | 136.6 | 135.8 | 142.5 | 149.3 | 147.9 | 147.4 | 115.0 | 137.1 | 146.8 |
| Other Labor Income[9] | 2074.9 | 2146.9 | 2218.7 | 2318.3 | 2415.6 | 2516.5 | 2641.2 | 2771.0 | 1861.6 | 2189.7 | 2586.1 |
| Proprietors Net Income[10] | 2720.4 | 2724.3 | 2728.0 | 2752.5 | 2826.1 | 2910.0 | 2936.4 | 2980.1 | 2613.4 | 2731.3 | 2913.2 |
| Non-Farm | 2067.0 | 2098.2 | 2136.3 | 2192.7 | 2240.0 | 2300.3 | 2361.0 | 2418.8 | 1935.5 | 2123.6 | 2330.0 |
| Farm | 653.4 | 626.1 | 591.6 | 559.8 | 586.1 | 609.7 | 575.4 | 561.3 | 677.9 | 607.7 | 583.1 |
| Residence Adjustment[11] | 292.5 | 295.4 | 296.1 | 305.4 | 315.7 | 321.4 | 324.3 | 328.4 | 269.6 | 297.3 | 322.5 |
| Other Income Items | 7243.3 | 7374.8 | 7709.2 | 7870.0 | 7997.1 | 8139.1 | 8458.1 | 8591.4 | 6777.6 | 7549.3 | 8296.4 |
| Property Income[12] | 3127.5 | 3157.3 | 3187.6 | 3235.2 | 3285.1 | 3337.9 | 3388.0 | 3447.7 | 2979.2 | 3176.9 | 3364.9 |
| Transfer Payments[13] | 4115.8 | 4217.5 | 4521.6 | 4634.8 | 4711.3 | 4801.2 | 5070.1 | 5143.7 | 3798.5 | 4372.4 | 4931.6 |
| Less: Personal Contributions for Social Insurance[14] | 1233.5 | 1253.5 | 1270.7 | 1293.7 | 1477.0 | 1513.3 | 1553.3 | 1590.4 | 1132.9 | 1262.9 | 1533.5 |

Forecast Date: March 15, 1980. Forecast based on author's national forecast, made using the Wharton Mark IV Quarterly Econometric Model of the United States.

See Footnotes at end of Table A-8.

TABLE A-3

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL FORECAST
EMPLOYMENT AND HOURS

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Employment (Thousands) | | | | | | | | | | | |
| Total Employment[3,4] | 1484.2 | 1486.2 | 1489.1 | 1491.5 | 1503.0 | 1517.5 | 1533.1 | 1543.2 | 1478.0 | 1487.7 | 1524.2 |
| Non-Agri. Employment | 1392.8 | 1394.8 | 1398.1 | 1401.2 | 1412.2 | 1425.7 | 1441.5 | 1451.8 | 1390.6 | 1396.7 | 1432.8 |
| Wage & Salary Employment | 1241.6 | 1241.2 | 1241.7 | 1242.0 | 1250.6 | 1261.0 | 1272.5 | 1278.6 | 1240.5 | 1241.6 | 1265.7 |
| Manufacturing | 295.4 | 293.5 | 293.2 | 294.5 | 296.5 | 297.1 | 300.7 | 303.5 | 294.4 | 294.2 | 299.4 |
| Durable Goods | 169.7 | 169.1 | 168.7 | 170.1 | 171.8 | 172.3 | 174.7 | 176.6 | 169.3 | 169.4 | 173.9 |
| Non-Durable Goods | 125.7 | 124.4 | 124.5 | 124.4 | 124.7 | 124.8 | 126.0 | 126.8 | 125.1 | 124.7 | 125.6 |
| Mining | 54.3 | 54.9 | 55.7 | 56.8 | 57.5 | 57.2 | 57.5 | 58.2 | 54.8 | 55.4 | 57.6 |
| Coal Mining | 49.0 | 49.7 | 50.5 | 51.5 | 52.1 | 51.8 | 52.1 | 52.6 | 49.5 | 50.2 | 52.2 |
| Other | 5.3 | 5.2 | 5.2 | 5.3 | 5.4 | 5.4 | 5.5 | 5.6 | 5.2 | 5.3 | 5.5 |
| Contract Construction | 66.7 | 66.3 | 64.6 | 59.1 | 63.1 | 68.3 | 72.4 | 71.3 | 69.0 | 64.2 | 68.8 |
| Regulated Industries | 69.4 | 70.2 | 70.5 | 70.6 | 70.9 | 72.9 | 74.0 | 74.5 | 70.4 | 70.2 | 73.1 |
| Wholesale & Retail Trade | 270.8 | 270.7 | 271.2 | 272.2 | 274.2 | 276.6 | 279.3 | 281.9 | 269.8 | 271.2 | 278.0 |
| Services | 210.5 | 213.4 | 216.6 | 219.8 | 221.3 | 223.3 | 224.5 | 226.2 | 204.5 | 215.1 | 223.8 |
| Finance, Insurance & Real Estate | 49.3 | 47.8 | 46.4 | 46.6 | 47.3 | 47.0 | 46.6 | 46.4 | 49.7 | 47.5 | 46.8 |
| Government | 225.1 | 224.4 | 223.5 | 222.3 | 219.8 | 218.5 | 217.5 | 216.6 | 227.8 | 223.8 | 218.1 |
| Federal | 39.0 | 39.0 | 39.0 | 39.0 | 38.0 | 38.0 | 38.0 | 38.0 | 39.0 | 39.0 | 38.0 |
| State & Local | 186.1 | 185.4 | 184.5 | 183.3 | 181.8 | 180.5 | 179.5 | 178.6 | 188.8 | 184.8 | 180.1 |
| Education | 106.3 | 106.1 | 105.8 | 105.2 | 104.8 | 104.3 | 104.1 | 104.0 | 105.3 | 105.8 | 104.3 |
| Other | 79.8 | 79.3 | 78.7 | 78.1 | 77.0 | 76.2 | 75.4 | 74.6 | 83.5 | 79.0 | 75.8 |
| All Other Non-Agri. Empl.[15] | 151.3 | 153.6 | 156.4 | 159.2 | 161.6 | 164.8 | 169.0 | 173.2 | 150.2 | 155.1 | 167.1 |
| Agricultural | 74.4 | 74.4 | 74.0 | 73.3 | 73.8 | 74.8 | 74.6 | 74.4 | 70.3 | 74.0 | 74.4 |
| Hired Workers | 24.3 | 24.2 | 23.8 | 22.9 | 23.2 | 23.9 | 23.5 | 23.1 | 21.1 | 23.8 | 23.4 |
| Family & Other Unpaid | 50.0 | 50.2 | 50.2 | 50.4 | 50.5 | 50.9 | 51.1 | 51.3 | 49.3 | 50.2 | 51.0 |
| Hours & Manhours[16] | | | | | | | | | | | |
| Average Weekly Hours | | | | | | | | | | | |
| Durable Manufacturing | 40.7 | 40.3 | 39.8 | 40.4 | 41.1 | 41.3 | 40.7 | 40.4 | 40.1 | 40.3 | 40.9 |
| Non-Durable Manufacturing | 40.2 | 40.6 | 39.7 | 39.8 | 40.0 | 40.0 | 40.0 | 40.0 | 39.5 | 40.1 | 40.0 |
| Manhours | | | | | | | | | | | |
| Total Manufacturing | 6218.8 | 6170.5 | 6057.3 | 6148.0 | 6264.2 | 6297.8 | 6313.6 | 6350.0 | 6099.1 | 6148.7 | 6306.4 |
| Durable Goods | 3590.4 | 3544.7 | 3488.1 | 3573.6 | 3670.7 | 3702.0 | 3692.4 | 3712.0 | 3531.7 | 3549.2 | 3694.3 |
| Non-Durable Goods | 2628.4 | 2625.8 | 2569.2 | 2574.4 | 2593.5 | 2595.8 | 2621.2 | 2638.0 | 2567.5 | 2599.5 | 2612.1 |
| Days & Man-Days | | | | | | | | | | | |
| Coal Mining Days Worked | 48.2 | 51.8 | 51.2 | 51.1 | 51.2 | 51.3 | 51.5 | 51.6 | 47.1 | 50.6 | 51.4 |
| Coal Mining Man-Days | 9449.4 | 10288.3 | 10344.3 | 10517.6 | 10678.7 | 10643.8 | 10715.6 | 10848.3 | 9339.7 | 10149.9 | 10721.6 |
| Labor Force | | | | | | | | | | | |
| Resident Adjusted Labor Force | 1596.8 | 1600.2 | 1604.3 | 1607.6 | 1619.6 | 1634.2 | 1649.3 | 1658.7 | 1584.9 | 1602.2 | 1640.5 |
| Labor Force (Not Res. Adj.) | 1579.8 | 1583.2 | 1587.3 | 1590.6 | 1602.6 | 1617.2 | 1632.3 | 1641.7 | 1567.9 | 1585.2 | 1623.5 |
| Unemployment (Thousands)[7] | 95.6 | 97.0 | 98.2 | 99.0 | 99.7 | 99.7 | 99.2 | 98.6 | 89.9 | 97.5 | 99.3 |
| Unemployment Rate (%) | 6.0 | 6.1 | 6.1 | 6.2 | 6.2 | 6.1 | 6.0 | 5.9 | 5.7 | 6.1 | 6.1 |

Forecast Date: March 15, 1980. Forecast based on author's national forecast, made using the Wharton Mark IV Quarterly Econometric Model of the United States.

See Footnotes at end of Table A-8.

TABLE A-4

KENTUCKY QUARTERLY ECONOMETRIC MODEL
CONTROL FORECAST
WAGES

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Average Annual Wages (Thousands)[18] | | | | | | | | | | | |
| Manufacturing | 17.2 | 17.4 | 17.4 | 18.0 | 18.6 | 18.9 | 19.1 | 19.3 | 15.9 | 17.5 | 19.0 |
| Durable Goods | 17.4 | 17.3 | 17.5 | 18.2 | 19.2 | 19.1 | 19.3 | 19.6 | 16.0 | 17.6 | 19.3 |
| Non-Durable Goods | 16.9 | 17.5 | 17.3 | 17.7 | 17.8 | 18.6 | 18.7 | 18.9 | 15.7 | 17.3 | 18.5 |
| Non-Manufacturing | 12.5 | 12.8 | 13.1 | 13.4 | 13.6 | 13.8 | 14.2 | 14.6 | 11.8 | 13.0 | 14.1 |
| Non-Agricultural | 12.7 | 13.0 | 13.3 | 13.6 | 13.8 | 14.0 | 14.4 | 14.8 | 11.9 | 13.2 | 14.3 |
| Mining | 21.3 | 23.3 | 23.5 | 23.8 | 24.2 | 24.7 | 25.2 | 25.6 | 19.8 | 23.0 | 24.9 |
| Contract Construction | 14.4 | 14.6 | 15.4 | 17.6 | 15.5 | 15.7 | 17.0 | 20.0 | 14.0 | 15.5 | 17.1 |
| Regulated Industries | 18.9 | 18.9 | 19.4 | 19.7 | 20.4 | 20.0 | 20.4 | 21.0 | 17.4 | 19.2 | 20.5 |
| Wholesale & Retail Trade | 9.8 | 10.0 | 10.2 | 10.4 | 10.7 | 10.9 | 11.1 | 11.4 | 9.2 | 10.1 | 11.0 |
| Services | 9.9 | 10.2 | 10.6 | 10.8 | 10.8 | 11.2 | 11.4 | 11.6 | 9.3 | 10.4 | 11.3 |
| Finance, Insurance & Real Estate | 12.3 | 12.7 | 13.3 | 13.5 | 13.9 | 14.1 | 14.6 | 14.8 | 11.2 | 12.9 | 14.4 |
| Government | 10.6 | 10.7 | 10.9 | 11.1 | 11.2 | 11.4 | 11.5 | 11.8 | 10.2 | 10.8 | 11.5 |
| Federal Civilian | 16.6 | 16.8 | 17.0 | 17.4 | 17.7 | 17.9 | 18.0 | 18.5 | 16.1 | 17.0 | 18.0 |
| State & Local | 9.3 | 9.5 | 9.6 | 9.7 | 9.9 | 10.0 | 10.2 | 10.3 | 9.0 | 9.5 | 10.1 |
| Agriculture[19] | 5.7 | 5.7 | 5.7 | 5.9 | 6.1 | 6.2 | 6.3 | 6.4 | 5.5 | 5.8 | 6.3 |
| Average Hourly Earnings | | | | | | | | | | | |
| Manufacturing | 8.2 | 8.3 | 8.4 | 8.6 | 8.8 | 8.9 | 9.1 | 9.2 | 7.7 | 8.4 | 9.0 |
| Durable Goods | 8.2 | 8.3 | 8.5 | 8.7 | 9.0 | 8.9 | 9.1 | 9.3 | 7.7 | 8.4 | 9.1 |
| Non-Durable Goods | 8.1 | 8.3 | 8.4 | 8.5 | 8.5 | 8.9 | 9.0 | 9.1 | 7.6 | 8.3 | 8.9 |
| Average Daily Earnings[20] | | | | | | | | | | | |
| Coal Mining | 114.5 | 116.4 | 118.4 | 120.4 | 122.4 | 124.4 | 126.5 | 128.7 | 108.7 | 117.4 | 125.5 |

Forecast Date: March 15, 1980. Forecast based on author's national forecast, made using the Wharton Mark IV Quarterly Econometric Model of the United States.

See Footnotes at end of Table A-8.

TABLE A-5

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATE FORECAST: TWO QUARTER DECLINE IN REAL GROSS NATIONAL PRODUCT
SELECTED ECONOMIC INDICATORS

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Personal Income (Millions)[2] | 27726.3 | 28063.1 | 28589.2 | 29225.5 | 29844.6 | 30711.5 | 31764.8 | 32659.1 | 26002.2 | 28401.0 | 31245.0 |
| % Chg.: Ky. Personal Income | 10.09 | 4.95 | 7.71 | 9.21 | 8.75 | 12.14 | 14.44 | 11.75 | 12.50 | 9.23 | 10.01 |
| Real Personal Income (1972 $) | 15971.4 | 15828.0 | 15812.6 | 15840.4 | 15857.9 | 16029.0 | 16289.6 | 16461.2 | 15916.4 | 15863.1 | 16159.4 |
| % Chg.: Ky. Real Personal Income | -1.12 | -3.54 | -0.39 | 0.70 | 0.44 | 4.39 | 6.67 | 4.28 | 3.29 | -0.34 | 1.87 |
| Wage and Salary Disbursement | 16646.6 | 16807.3 | 16955.6 | 17340.3 | 17822.3 | 18383.2 | 19001.3 | 19624.3 | 15622.4 | 16937.4 | 18707.8 |
| Mfg. Wage & Salaries | 4973.9 | 4896.1 | 4798.4 | 4912.7 | 5157.5 | 5324.7 | 5495.4 | 5622.8 | 4669.7 | 4895.3 | 5400.1 |
| Non-Mfg. Wage & Salaries | 11672.6 | 11911.2 | 12157.1 | 12427.7 | 12664.8 | 13058.5 | 13505.9 | 14001.5 | 10952.7 | 12042.1 | 13307.7 |
| Total Employment (Thousands)[3,4] | 1479.0 | 1472.1 | 1468.5 | 1465.1 | 1472.1 | 1488.5 | 1506.1 | 1517.5 | 1478.0 | 1471.2 | 1496.1 |
| Non-Agri. Wage & Salary Empl. | 1239.7 | 1232.6 | 1227.7 | 1223.1 | 1228.1 | 1240.8 | 1254.9 | 1262.7 | 1240.3 | 1230.8 | 1246.6 |
| % Chg.: Ky. Non-Agri. Empl. | 0.79 | -2.29 | -1.59 | -1.48 | 1.63 | 4.21 | 4.64 | 2.51 | 2.57 | -0.77 | 1.29 |
| Manufacturing Employment | 290.4 | 284.4 | 279.7 | 278.1 | 282.9 | 287.2 | 292.0 | 295.2 | 294.4 | 283.2 | 289.3 |
| Durable Goods | 164.0 | 158.4 | 153.8 | 152.3 | 156.3 | 159.1 | 161.6 | 163.1 | 169.3 | 157.1 | 160.0 |
| Non-Durable Goods | 126.4 | 126.0 | 125.9 | 125.8 | 126.6 | 128.1 | 130.4 | 132.2 | 125.1 | 126.0 | 129.3 |
| Non-Mfg. Non-Agri. Empl.[5] | 949.4 | 948.2 | 948.0 | 945.0 | 945.1 | 953.6 | 962.9 | 967.5 | 945.9 | 947.6 | 957.3 |
| Civilian Labor Force (Thousands)[6] | 1591.8 | 1586.5 | 1584.7 | 1582.7 | 1590.7 | 1607.2 | 1623.9 | 1634.0 | 1584.8 | 1586.4 | 1614.0 |
| Ky. Unemployment Rate (%)[7] | 6.0 | 6.1 | 6.3 | 6.4 | 6.4 | 6.3 | 6.2 | 6.1 | 5.7 | 6.2 | 6.3 |

Forecast Date: February 22, 1980. Forecast Based on Wharton National Control Forecast of January 28, 1980.

See Footnotes at end of Table A-8.

TABLE A-6

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATE FORECAST
PERSONAL INCOME

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Personal Income (Millions)[2] | 27726.3 | 28063.1 | 28589.2 | 29225.5 | 29844.6 | 30711.5 | 31764.8 | 32659.1 | 26002.2 | 28401.0 | 31245.0 |
| Wage & Salary Disbursements | 16646.6 | 16807.3 | 16955.6 | 17340.3 | 17822.3 | 18383.2 | 19001.3 | 19624.3 | 15622.4 | 16937.4 | 18707.8 |
| Non-Agri. Wages & Salaries | 16509.0 | 16669.2 | 16819.2 | 17204.8 | 17680.1 | 18234.2 | 18853.4 | 19477.0 | 15507.4 | 16800.5 | 18561.2 |
| Manufacturing | 4973.9 | 4896.1 | 4798.4 | 4912.7 | 5157.5 | 5324.7 | 5495.4 | 5622.8 | 4669.7 | 4895.3 | 5400.1 |
| Durable Goods | 2810.6 | 2668.4 | 2598.2 | 2658.0 | 2903.6 | 2964.6 | 3044.6 | 3116.3 | 2709.2 | 2683.8 | 3007.3 |
| Non-Durable Goods | 2163.4 | 2227.8 | 2200.3 | 2254.7 | 2253.9 | 2360.1 | 2450.7 | 2506.5 | 1960.5 | 2211.5 | 2392.8 |
| Mining | 1108.2 | 1197.1 | 1249.6 | 1296.9 | 1346.0 | 1388.6 | 1438.0 | 1492.4 | 1083.5 | 1213.0 | 1416.3 |
| Coal Mining | 1033.9 | 1118.3 | 1167.1 | 1209.8 | 1254.4 | 1293.6 | 1339.3 | 1389.5 | 1012.8 | 1132.3 | 1319.2 |
| Other Mining | 74.4 | 78.8 | 82.5 | 87.1 | 91.6 | 94.9 | 98.7 | 102.9 | 70.7 | 80.7 | 97.0 |
| Contract Construction | 904.4 | 878.1 | 863.0 | 854.6 | 845.9 | 951.8 | 1112.8 | 1287.7 | 880.6 | 875.0 | 1049.5 |
| Regulated Industries | 1273.4 | 1285.7 | 1291.1 | 1347.5 | 1395.0 | 1406.6 | 1411.9 | 1473.8 | 1161.4 | 1299.4 | 1421.8 |
| Wholesale & Retail Trade | 2639.0 | 2689.6 | 2741.4 | 2801.4 | 2896.9 | 2975.8 | 3064.8 | 3153.8 | 2475.5 | 2717.9 | 3022.8 |
| Services | 2094.1 | 2170.3 | 2282.2 | 2354.7 | 2379.1 | 2471.7 | 2550.0 | 2614.0 | 1896.5 | 2225.3 | 2503.7 |
| Finance, Insurance & Real Estate | 603.3 | 606.5 | 616.1 | 613.6 | 637.2 | 645.3 | 665.9 | 673.2 | 554.5 | 609.9 | 655.4 |
| Government | 2912.6 | 2945.7 | 2977.2 | 3023.4 | 3022.5 | 3069.9 | 3114.7 | 3159.3 | 2785.6 | 2964.7 | 3091.6 |
| Civilian Government | 2397.6 | 2423.7 | 2451.2 | 2491.4 | 2478.5 | 2508.9 | 2532.7 | 2572.3 | 2282.9 | 2441.0 | 2523.1 |
| Federal Civilian | 649.0 | 655.3 | 661.8 | 679.8 | 673.5 | 680.4 | 684.4 | 702.8 | 627.1 | 661.5 | 685.3 |
| State & Local Government | 1748.5 | 1768.4 | 1789.4 | 1811.7 | 1805.0 | 1828.5 | 1848.4 | 1869.6 | 1655.8 | 1779.5 | 1837.8 |
| Federal Military | 515.0 | 522.0 | 526.0 | 532.0 | 544.0 | 561.0 | 582.0 | 587.0 | 502.8 | 523.8 | 568.5 |
| Agricultural Wage & Salary[8] | 137.6 | 138.1 | 136.4 | 135.5 | 142.2 | 149.0 | 147.9 | 147.3 | 115.0 | 136.9 | 146.6 |
| Other Labor Income[9] | 2032.4 | 2076.2 | 2119.0 | 2199.1 | 2305.2 | 2418.8 | 2545.2 | 2675.3 | 1837.7 | 2106.7 | 2486.1 |
| Proprietors Net Income[10] | 2730.1 | 2738.5 | 2746.7 | 2765.1 | 2840.9 | 2929.7 | 2956.5 | 2998.6 | 2615.2 | 2745.1 | 2931.4 |
| Non-Farm | 2076.6 | 2112.3 | 2154.9 | 2205.2 | 2254.7 | 2319.8 | 2381.1 | 2437.2 | 1937.3 | 2137.2 | 2348.2 |
| Farm | 653.4 | 626.3 | 591.9 | 559.9 | 586.2 | 609.9 | 575.4 | 561.4 | 677.9 | 607.9 | 583.2 |
| Residence Adjustment[11] | 291.2 | 292.6 | 291.7 | 300.3 | 309.9 | 315.2 | 319.9 | 323.8 | 269.6 | 293.9 | 317.2 |
| Other Income Items | 7243.3 | 7374.8 | 7709.2 | 7870.0 | 7997.1 | 8139.1 | 8458.1 | 8591.4 | 6777.6 | 7549.3 | 8296.4 |
| Property Income[12] | 3127.5 | 3157.3 | 3187.6 | 3235.2 | 3285.8 | 3337.9 | 3388.0 | 3447.7 | 2979.2 | 3176.9 | 3364.9 |
| Transfer Payments[13] | 4115.8 | 4217.5 | 4521.6 | 4634.8 | 4711.3 | 4801.2 | 5070.1 | 5143.7 | 3798.5 | 4372.4 | 4931.6 |
| Less: Personal Contributions for Social Insurance[14] | 1217.3 | 1226.4 | 1232.9 | 1249.3 | 1430.9 | 1474.4 | 1516.1 | 1554.3 | 1120.3 | 1231.5 | 1493.9 |

Forecast Date: February 22, 1980. Forecast based on Wharton National Control Forecast of January 28, 1980.

See Footnotes at end of Table A-8.

TABLE A-7

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATE FORECAST
EMPLOYMENT AND HOURS

| Description | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Employment (Thousands) | | | | | | | | | | | |
| Total Employment[3,4] | 1479.0 | 1472.1 | 1468.5 | 1465.1 | 1472.1 | 1488.5 | 1506.1 | 1517.5 | 1478.0 | 1471.2 | 1496.1 |
| Non-Agri. Employment | 1391.4 | 1386.8 | 1385.0 | 1383.4 | 1390.7 | 1406.8 | 1425.2 | 1437.2 | 1390.6 | 1386.7 | 1415.0 |
| Wage & Salary Employment | 1239.7 | 1232.6 | 1227.7 | 1223.1 | 1228.1 | 1240.8 | 1254.9 | 1262.7 | 1340.3 | 1230.8 | 1246.6 |
| Manufacturing | 290.4 | 284.4 | 279.7 | 278.1 | 282.9 | 287.2 | 292.0 | 295.2 | 294.4 | 283.2 | 289.3 |
| Durable Goods | 164.0 | 158.4 | 153.8 | 152.3 | 156.3 | 159.1 | 161.6 | 163.1 | 169.3 | 157.1 | 160.0 |
| Non-Durable Goods | 126.4 | 126.0 | 125.9 | 125.8 | 126.6 | 128.1 | 130.4 | 132.2 | 125.1 | 126.0 | 129.3 |
| Mining | 53.8 | 54.0 | 54.1 | 54.3 | 54.6 | 54.9 | 55.3 | 55.9 | 54.8 | 54.1 | 55.2 |
| Coal Mining | 48.5 | 48.7 | 48.7 | 48.9 | 49.1 | 49.2 | 49.6 | 50.1 | 49.5 | 48.7 | 49.5 |
| Other | 5.4 | 5.3 | 5.4 | 5.5 | 5.6 | 5.6 | 5.7 | 5.8 | 5.2 | 5.4 | 5.7 |
| Contract Construction | 65.7 | 63.9 | 61.6 | 57.4 | 59.3 | 63.2 | 67.3 | 67.5 | 70.8 | 62.2 | 64.3 |
| Regulated Industries | 67.1 | 66.8 | 67.8 | 66.7 | 65.8 | 66.1 | 68.1 | 68.2 | 69.4 | 67.1 | 67.1 |
| Wholesale & Retail Trade | 270.3 | 269.9 | 270.1 | 271.0 | 272.9 | 275.0 | 277.4 | 279.9 | 269.6 | 270.3 | 276.3 |
| Services | 210.8 | 213.6 | 216.3 | 218.7 | 220.1 | 222.0 | 223.1 | 224.7 | 204.0 | 214.8 | 222.5 |
| Finance, Insurance & Real Estate | 49.5 | 48.3 | 46.9 | 46.0 | 45.9 | 46.0 | 45.9 | 46.0 | 49.6 | 47.7 | 45.9 |
| Government | 232.1 | 231.6 | 231.2 | 230.9 | 226.6 | 226.4 | 225.8 | 225.3 | 227.8 | 231.5 | 226.0 |
| Federal | 39.0 | 39.0 | 39.0 | 39.0 | 38.0 | 38.0 | 38.0 | 38.0 | 39.0 | 39.0 | 38.0 |
| State & Local | 193.1 | 192.6 | 192.2 | 191.9 | 188.6 | 188.4 | 187.8 | 187.3 | 188.8 | 192.4 | 188.0 |
| Education | 113.3 | 113.3 | 113.5 | 113.8 | 111.6 | 112.2 | 112.4 | 112.7 | 105.3 | 113.5 | 112.2 |
| Other | 79.8 | 79.3 | 78.7 | 78.1 | 77.0 | 76.2 | 75.4 | 74.6 | 83.5 | 79.0 | 75.8 |
| All Other Non-Agri. Empl.[15] | 151.6 | 154.3 | 157.4 | 160.3 | 162.7 | 166.0 | 170.3 | 174.5 | 150.3 | 155.9 | 168.4 |
| Agricultural | 70.6 | 68.2 | 66.4 | 64.7 | 64.4 | 64.7 | 63.9 | 63.2 | 70.4 | 67.5 | 64.0 |
| Hired Workers | 24.4 | 24.4 | 24.2 | 23.3 | 23.7 | 24.4 | 23.8 | 23.4 | 21.1 | 24.1 | 23.8 |
| Family & Other Unpaid | 46.2 | 43.9 | 42.3 | 41.4 | 40.7 | 40.4 | 40.1 | 39.8 | 49.3 | 43.5 | 40.2 |
| Hours & Manhours[16] | | | | | | | | | | | |
| Average Weekly Hours | | | | | | | | | | | |
| Durable Manufacturing | 40.3 | 39.6 | 38.7 | 39.2 | 40.2 | 40.6 | 40.1 | 39.8 | 40.1 | 39.4 | 40.2 |
| Non-Durable Manufacturing | 40.2 | 40.6 | 39.7 | 39.8 | 40.0 | 40.0 | 40.0 | 40.0 | 39.5 | 40.1 | 40.0 |
| Manhours | | | | | | | | | | | |
| Total Manufacturing | 6079.9 | 5918.5 | 5690.9 | 5706.3 | 5903.3 | 6026.6 | 6079.7 | 6126.3 | 6099.2 | 5848.9 | 6034.0 |
| Durable Goods | 3437.7 | 3258.1 | 3092.6 | 3101.7 | 3270.5 | 3361.4 | 3366.7 | 3377.4 | 3531.7 | 3222.5 | 3344.0 |
| Non-Durable Goods | 2642.3 | 2660.5 | 2598.3 | 2604.6 | 2632.8 | 2665.3 | 2713.0 | 2748.9 | 2567.5 | 2626.4 | 2690.0 |
| Days & Man-Days | | | | | | | | | | | |
| Coal Mining Days Worked | 46.3 | 48.7 | 49.6 | 50.1 | 50.6 | 50.8 | 51.0 | 51.2 | 47.1 | 48.7 | 50.9 |
| Coal Mining Man-Days | 8972.9 | 9484.9 | 9672.7 | 9798.8 | 9928.7 | 10006.1 | 10123.6 | 10263.4 | 9339.7 | 9482.3 | 10080.4 |
| Labor Force | | | | | | | | | | | |
| Resident Adjusted Labor Force | 1591.8 | 1586.5 | 1584.7 | 1582.7 | 1590.7 | 1607.2 | 1623.9 | 1634.0 | 1584.8 | 1586.4 | 1614.0 |
| Labor Force (Not Res. Adj.) | 1574.8 | 1569.5 | 1567.7 | 1565.7 | 1573.7 | 1590.2 | 1606.9 | 1617.0 | 1567.8 | 1569.4 | 1597.0 |
| Unemployment (Thousands)[17] | 95.8 | 97.4 | 99.2 | 100.6 | 101.6 | 101.7 | 100.8 | 99.5 | 89.9 | 98.3 | 100.9 |
| Unemployment Rate (%) | 6.0 | 6.1 | 6.3 | 6.4 | 6.4 | 6.3 | 6.2 | 6.1 | 5.7 | 6.2 | 6.3 |

Forecast Date: February 22, 1980. Forecast based on Wharton National Control Forecast of January 28, 1980.

See Footnotes at end of Table A-8.

TABLE A-8

KENTUCKY QUARTERLY ECONOMETRIC MODEL
ALTERNATIVE FORECAST: EFFECT OF ECONOMIC POLICIES ANNOUNCED MARCH 14, 1980
SELECTED ECONOMIC INDICATORS

| | Quarterly[1] | | | | | | | | Annual | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Description | 1980.1 | 1980.2 | 1980.3 | 1980.4 | 1981.1 | 1981.2 | 1981.3 | 1981.4 | 1979 | 1980 | 1981 |
| Personal Income (Millions)[2] | 27701.9 | 28254.9 | 28971.4 | 29625.0 | 30075.8 | 30659.0 | 31520.6 | 32366.2 | 26208.0 | 28638.3 | 31155.4 |
| % Chg.: Ky. Personal Income | 5.62 | 8.23 | 10.54 | 9.33 | 6.23 | 7.98 | 11.72 | 11.17 | 13.39 | 9.27 | 8.79 |
| Real Personal Income (Millions 1972 $) | 15966.5 | 15936.2 | 15979.8 | 16013.5 | 15946.9 | 15968.2 | 16123.1 | 16256.3 | 16042.2 | 15974.0 | 16073.6 |
| % Chg.: Ky. Real Personal Income | -4.91 | -0.76 | 1.10 | 0.85 | -1.65 | 0.54 | 3.94 | 3.34 | 4.10 | -0.43 | 0.62 |
| Wage and Salary Disbursement | 16730.7 | 16994.4 | 17251.2 | 17628.8 | 17942.3 | 18202.6 | 18567.6 | 19094.9 | 15818.5 | 17151.3 | 18451.8 |
| Mfg. Wage and Salaries | 5012.5 | 4978.7 | 4950.8 | 5112.8 | 5299.3 | 5396.1 | 5488.6 | 5574.9 | 4669.8 | 5013.7 | 5439.7 |
| Non-Mfg. Wage and Salaries | 11718.2 | 12015.7 | 12300.4 | 12516.0 | 12642.9 | 12806.4 | 13079.1 | 13520.1 | 11148.8 | 12137.6 | 13012.1 |
| Total Employment (Thousands)[3,4] | 1475.9 | 1471.6 | 1465.7 | 1460.1 | 1462.4 | 1466.6 | 1475.6 | 1489.5 | 1478.0 | 1468.3 | 1473.5 |
| Non-Agri. Wage & Salary Employment | 1233.3 | 1226.3 | 1217.8 | 1209.7 | 1208.3 | 1206.9 | 1209.5 | 1217.5 | 1240.5 | 1221.7 | 1210.6 |
| % Chg.: Ky. Non-Agri. Employment | -2.06 | -2.25 | -2.75 | -2.63 | -0.45 | -0.47 | 0.87 | 2.69 | 2.59 | -1.52 | -0.92 |
| Manufacturing Employment | 292.5 | 287.7 | 284.8 | 284.2 | 284.5 | 283.3 | 285.2 | 286.3 | 294.4 | 287.3 | 284.9 |
| Durable Goods | 165.5 | 160.4 | 155.9 | 153.8 | 152.4 | 150.1 | 150.0 | 149.6 | 169.3 | 158.9 | 150.5 |
| Non-Durable Goods | 127.0 | 127.2 | 128.9 | 130.4 | 132.1 | 133.3 | 135.2 | 136.8 | 125.1 | 128.4 | 134.3 |
| Non-Mfg., Non-Agri. Employment[5] | 940.8 | 938.6 | 933.0 | 925.5 | 923.8 | 923.5 | 924.3 | 931.2 | 946.1 | 934.5 | 925.7 |
| Civilian Labor Force (Thousands)[6] | 1588.7 | 1586.2 | 1582.1 | 1578.0 | 1581.6 | 1586.5 | 1595.5 | 1609.2 | 1584.9 | 1583.8 | 1593.2 |
| Kentucky Unemployment Rate (%)[7] | 6.0 | 6.2 | 6.3 | 6.4 | 6.5 | 6.5 | 6.5 | 6.4 | 5.7 | 6.2 | 6.4 |

Forecast Date: March 30, 1980. Forecast based upon Wharton Control Forecast of March 28, 1980.

[1] Unless otherwise indicated, all quarterly projections are computed at an annual rate, by multiplying the quarterly data by four.

[2] Personal Income is the sum of the indented components under personal income in Tables A-2 and A-6.

[3] Total employment is comprised of all paid workers, unpaid workers with fifteen or more hours per week in family operated enterprises, and persons who have jobs but who are temporarily not working due to illness, personal reasons, weather, vacation, or labor management disputes. For detailed information, see Charles G. Renfro and Paul A. Coomes. *Kentucky Economic Information System User Manual* (Lexington, Kentucky: Office for Research, College of Business and Economics, University of Kentucky, 1977), Section 2.4, or *BLS Handbook of Methods,* U.S. Department of Labor, Bureau of Labor Statistics (Washington, D.C.: U.S. Government Printing Office, 1976), pp. 27-28.

[4] Total employment is not equal to the sum of the components of Tables A-3 or A-7, because total employment figures are on a place-of-residence basis, whereas employment components are on a place-of-work basis.

[5] The breakdown of nonmanufacturing, nonagricultural employment is shown in Tables A-3 and A-7.

[6] Civilian Labor Force includes all civilian residents, sixteen years of age or over, who are either employed or reported to be actively seeking work.

[7] The unemployment rate is computed as the number of unemployed as a percent of the civilian labor force.

[8] Agricultural wage and salary income represents the income of hired farm workers. This figure does not include the income of farm proprietors and unpaid family workers.

[9] Other labor income includes such items as employer contributions to private pension funds, health, and welfare plans.

[10] Proprietors' net income measures the net business earnings of unincorporated enterprises, consisting of sole proprietors, partnerships, and producers' cooperatives (farmers, independent professional practitioners–e.g., physicians, lawyers–nonfarm entrepreneurs, and other self-employed).

[11] A residence adjustment is made to personal income in order to account for the net out-of-state wage and salary earnings of Kentucky residents. On comparing these forecast figures of personal income and its components to the historical Bureau of Economic Analysis (BEA) estimates of personal income and its components, it will be noted that BEA has historically estimated a considerably lower value for residents' earnings out-of-state than has the staff of the Kentucky Council of Economic Advisors. The staff opinion is reflected in the forecast from the Kentucky Quarterly Econometric Model.

[12] Property income consists of rental income, dividends, and interest payments to persons, nonprofit institutions, and private pensions and trust funds.

[13] Transfer payments comprise receipts from government and business (for which no services are rendered) to persons, nonprofit institutions, and private pension and trust funds. Government transfer payments include social security payments, veterans' benefits, welfare payments, and unemployment compensation, etc. Business transfer payments include gifts to nonprofit institutions and consumer bad debts, among other items.

[14] Personal contributions for social insurance are excluded from personal income. While these contributions are part of an individual's earnings, they are not received by that individual in the current period.

[15] All other nonagricultural employment includes nonagricultural self-employed and unpaid family workers, plus domestic workers in private households.

[16] Hours, man-hours, days, and man-days refer only to those employees who were *actually* working during the given time period.

[17] Unemployment is comprised of persons reported as not working but looking for work, persons laid-off work but waiting to report back to work, and persons waiting to report to a new wage or salary job. For more details, see Renfro and Coomes, Section 2.4 or the *BLS Handbook of Methods,* p. 6.

[18] Historically, figures for average annual wages are computed by dividing the wage and salary income originating in each industry by the wage and salary employment in that industry. Projections are on the same conceptual basis.

[19] Agricultural annual average wages refer only to earnings of hired farm workers. Farm proprietors or family workers are not included.

[20] Conceptually, coal mining average daily earnings are computed by dividing income originating in coal mining by the man-days worked in the industry. Consequently, the employees include all wage and salary workers, not just production workers.

# III. Regional Analysis of Kentucky

by Charles W. Hultman

Except for the material concerning the cities of Lexington and Louisville, the chapters in this *Annual Report* essentially present state-level analyses. In these chapters, personal income, employment and other economic variables are examined on a statewide basis. An approach of this type allows the economic performance of the state to be considered on average. However, it has the limitation that it does not take account of the fact that the state's economic structure is quite diverse from one region or area to a second; the employment and industrial composition, the current obstacles to growth, and the development problems of western Kentucky are significantly different from eastern, northern, or south central Kentucky.

The purpose of this chapter is to examine the state on a regional basis in order to illustrate the diversity of Kentucky's regions. Each of the fifteen Area Development Districts is considered to be an appropriate area for description and analytical purposes. This approach makes it possible to examine the economy of a region within the framework of the conditions that actually prevail within that region. An additional reason for using a regional approach is to take advantage of the knowledge and expertise of persons closest to conditions and developments in that area. This type of analysis, of course, complements that undertaken either at the state level or, at the other extreme, the county or city level.

In order to obtain information about the characteristics (current performance, problems, etc.) of each of the Area Development Districts (ADDs), a questionnaire was distributed through the Kentucky Association of Area Development District Directors. This questionnaire requested a response from each of the fifteen ADDs to questions relating to the noticeable economic characteristics of the ADD, the major development problems that seem apparent, the identification of growing and declining industries, and the major focus of area development programs. Specifically, the questions asked were:

1. What is the most noticeable economic characteristic of your ADD?
2. What are the major development problems that you see, both generally and in terms of specific industries (e.g., population movements, transportation, pollution, water, etc.; manufacturing, coal, agriculture)?
3. What are your growth industries? Why?
4. What are the declining industries in your ADD? Why?
5. What industries show little change over the past ten years? Why?
6. What is the major focus of your area development program?
7. Any other aspects of your ADD which you feel need to be described in the KCEA *Annual Report.*

The material analyzing conditions and problems for each ADD reflects the perceptions of persons actually involved in the developmental efforts of that ADD.[1] The Council staff neither verified nor altered the responses secured from each of the ADDs, although the material was reorganized and edited to provide a degree of uniformity and thus facilitate comparison. However, there are significant variations in the length, content and outlook expressed by the different contributors. The information is also supplemented with economic, social and demographic figures pertinent to each ADD. The location and counties included in each of the ADDs is shown on Map 1; per capita income in each District for 1972 and 1977 is contained in Table 1.

## Barren River Area Development District

The Barren River Area Development District is a ten county area in south central Kentucky with a 1978 population of 201,500. Per capita income in 1977 was $5,093, somewhat below the state average.

The Barren River ADD is a reasonably balanced area in terms of the existence and growth in industry, commerce, service and tourism. Government regulation of various types is perceived as a major development problem, especially the regulations and activities of the Environmental Protection Agency, the Departments of Labor, Health and Welfare, and Education. Many of the other problems of the area are related to the declining availability and higher cost of electricity, gas and fuels for motor transportation.

Agriculture is one of the ADD's growth industries. This industry appears to be responding to increased dependence on food products which do not have to be imported. Services are also expanding; the employment

MAP 1

OFFICIAL BOUNDARIES OF THE
KENTUCKY AREA DEVELOPMENT DISTRICTS

TABLE 1

PER CAPITA PERSONAL INCOME
BY AREA DEVELOPMENT DISTRICTS
1972 AND 1977

| District | 1972 Per Capita Income | 1977 Per Capita Income |
|---|---|---|
| Purchase | $3,422 | $5,857 |
| Pennyrile | 3,620 | 6,173 |
| Green River | 3,784 | 6,465 |
| Barren River | 2,990 | 5,093 |
| Lincoln Trail | 3,413 | 5,015 |
| KIPDA | 4,605 | 7,417 |
| Northern Kentucky | 3,969 | 6,516 |
| Buffalo Trace | 2,909 | 4,773 |
| Gateway | 2,625 | 4,379 |
| Fivco | 3,135 | 5,720 |
| Big Sandy | 2,569 | 4,953 |
| Kentucky River | 2,318 | 4,262 |
| Cumberland Valley | 2,406 | 4,481 |
| Lake Cumberland | 2,531 | 4,068 |
| Bluegrass | 3,870 | 6,286 |

SOURCE: Kentucky Council of Economic Advisors and Kentucky Department of Commerce. *Kentucky Personal Income Report*, November 1979.

in this sector continues to grow from the expansion of government and the need for expertise to respond to governmental regulation. Declining industries in the ADD include tourism and minerals. Both are heavily dependent on the availability of motor fuels. Industrial firms related to the auto industry are also experiencing layoffs. In the housing sector, inflationary costs of materials and labor and, more recently, high interest costs, have kept the entire industry in a weakened condition for a decade.

There is a concern that the government cannot cope with certain economic problems. This declining morale may be causing a reduction in growth activities—a lessening of investment optimism. This is reflected in more cautious banking activities in the smaller communities.

The major focus of the area development program involves support for economic development through technical assistance to local governments and the economic leadership.

## Big Sandy Area Development District

The Big Sandy Area Development District, with a 1978 population of 164,800, is located in the easternmost part of the Commonwealth. Its most noticeable economic characteristic is the abundance of energy resources particularly coal and natural gas. In fact, the Big Sandy Area of Pike, Floyd and Martin Counties are among the largest coal producing areas in the world.

The major development problems of the area relate to the nature of the land area, transportation, water and sewer facilities, housing, and pollution. Very little land is available in the Big Sandy for industrial or housing development. The area is very steep with very narrow valleys most of which are in the flood plain.

Transportation used to be a major problem in all of the Big Sandy, but the main population centers now have at least adequate transportation facilities; however, off the few main roads the transportation problem is acute with narrow roads in poor condition and much traffic congestion.

Water and sewer needs are critical in some areas. The major cities have adequate water resources and good sewage disposal; however, the smaller cities and the counties in general have no sewage systems. Magoffin County has no rural water system at this time.

There is a very severe shortage of housing in the Big Sandy ADD of both rental and new and existing housing. This is partially related to lack of land area and of large developers.

A pollution problem occurs as a result of the run-off from strip mining; however, this has decreased in recent years due to better mining management. Solid waste also continues to be a problem due to the difficulty in finding acceptable sites for landfills.

Mining is by far the most important industry economically; the economic well-being of the area depends upon the ups and downs of the coal industry. A major problem of the coal industry is the regulation of the industry by the federal government. Another problem may be competition with the coal from the Western states. Eastern Kentucky coal is more expensive to mine due to the terrain in which the coal is located.

The energy shortage has stimulated new interest in coal mining. This in turn has spurred the service industries, especially those related to the coal industry. Coal mining is experiencing some difficulty but it is expected to pick up because of the energy crisis. The decline has been far more apparent among the smaller operators who find it difficult to finance the changes required because of federal regulations.

Manufacturing has many problems in locating in eastern Kentucky including the lack of industrial parks and available land, the lack of available housing, and the lack of certain services such as adequate water, sewer, good rural roads, and adequate emergency medical services.

Little change over the past ten years has occurred in such industries as house building, teaching profession, retailing, and certain service industries.

The major efforts of the area development program include enterprise development, continued improvement in transportation, expansion of water-sewer services into rural areas, and the expansion of human resources.

The Big Sandy ADD has from its beginning been known as "Action-Oriented." It has always been concerned with planning that had the greatest chances of being implemented. Emphasis has been given to those activities or ideas that could bring about change in the immediate and intermediate future rather than concerning itself with projections and plans designed to meet the Area needs in the next twenty years. While Big Sandy ADD leaders are not fatalists, there has always been the feeling that no one could accurately determine the "boom-bust" future of an area which is almost entirely dependent upon coal. Today, the consensus of Area leaders is that Washington should look to eastern Kentucky coal to help remove the nation's dependence on foreign oil.

## Bluegrass Area Development District

The Bluegrass Area Development District represents a 17 county area in north central Kentucky. In recent years, it has experienced a relatively high rate of population and economic growth.

The most noticeable characteristic of the Bluegrass ADD economy is its employment diversity—no one sector is dominant. There is a healthy mix of employment in agriculture, manufacturing, trade and services, wholesale and retail trade and government. This mix of employment opportunities makes the BGADD economy resilient to national economic shifts and maintains a rather stable economic setting. The results are low unemployment rates and relatively high incomes, district-wide.

There are several development problems in the Bluegrass ADD. The ones that generally apply throughout the District are relatively high land values, shortage of "risk" capital for start-up businesses, high wage rates in several communities, and lack of development expertise at the local level. Some of the more specific problems include air pollution nonattainment areas in Lexington and Richmond, extremely high cost of living in Lexington and the surrounding area, limited growth in basic manufacturing jobs, and poor land use controls and protective zoning.

The fastest growing industries in the area are corporate headquarters, finance, real estate, insurance and other service type industries. Service-type firms have moved into central Kentucky at a high rate during the last decade. The apparent reasons for this growth include the area's quality of life, environmental quality, a qualified labor supply, and the proximity to a large urban area.

In terms of real employment, certain manufacturing and assembly type industries may have declined somewhat. Industries that depend on low-cost labor and/or physical plant have been leaving central Kentucky and going to more rural areas.

Agriculture and manufacturing have shown little change over the past ten years, because of high land costs and wage rates. Manufacturing has gained slightly, but other service type industries now replace its once important place in the Bluegrass economy.

The major adopted goal of the ADD is to foster economic growth and development. A substantial amount of time is devoted to providing technical assistance to units of local government and their designated agencies. This is viewed as capacity building, and the goal is to provide objective information on which decisions can be made.

## Buffalo Trace Area Development District

The Buffalo Trace Area Development District, which covers five counties in northeast Kentucky, experienced a relatively low population growth rate during the first part of the 1970s. Average per capita income in 1977 was $4,773 as compared with the state average of $6,020.

An important economic characteristic of the Buffalo Trace ADD is the stable and productive work force. The largest employers are agriculture and retail trade. As in many rural areas, manufacturing jobs are primarily found in the garment, shoe and related industries. An associated factor is a large number of women in the work force with wages generally below the state average. Productivity has been slowly yet steadily climbing and the area's political and business climate is receptive to industrial growth and expansion.

The major developmental problems facing Buffalo Trace ADD include transportation, provision of services and a loss of young people to urban areas. Buffalo Trace needs improved access through road and rail line improvements and viable water and air transportation service and facilities. This increased access would enable the region to take advantage of its location near some of the major market areas in the United States. The need for additional service, such as water and sewer lines, would enhance the area's ability to attract industry. The lack of services and efficient transportation results in an absence of amenities conducive to development. Population projections predict an increase in the BTADD, yet many of the area's talented young are migrating to higher paying jobs in nearby urban areas such as Lexington and Cincinnati.

Developmental problems facing specific industries

include a lack of diversity in manufacturing, difficulty in developing industrial sites and agriculture's decline as an employer. A serious development problem facing agriculture is a high dependence on tobacco as the chief cash crop. In general, the specific industries of the area suffer from the same problems as previously delineated; i.e., lack of transportation, industrial diversity and a rural market.

The primary growth industry in the BTADD is power generating plants because of proximity to the Appalachian coal fields, the Ohio River and major energy markets. Plastic products manufacture is another growth industry located in the area. Their success is due to good management, cheap labor and market proximity. Fabrication of pulleys, ballbearings, and gears is also a strong viable industry for much the same reason.

Recent growth has occurred in the retail food industry as people demand more fast food and convenience establishments. Housing construction is a definite growth industry in the BTADD and is closely allied to retail construction materials business increases.

Sectors experiencing a slight decline are the shoe and garment industries because of drop in demand. Both industries fluctuate with the national market which is very susceptible to consumer whims and fashions. Another contributing factor is the stiff competition from oversea's producers which can produce the same goods at less expense than U.S. companies.

The industries demonstrating the most consistency have been agriculture, cement and lumber. Agriculture production has remained fairly constant with tobacco and dairy production being the most dependable. Concrete and lumber fluctuate with the construction industry but have remained relatively stable over the past few years. The reason is that the local area has grown steadily but slowly over the years and, therefore, there has been no significant increase or decrease extending over a lengthy period of time. This is expected to change as economic growth creates an additional demand for housing. Retail trade has also proven to be a stable industry. The region serves as a retail and service center for a predominately rural area. The population has been relatively stable experiencing alternately moderate decline and growth resulting in a consistent demand for available services. Tourism has remained relatively constant, although still a significantly small segment of the economy.

The ADD's major priority is economic growth and development. This involves transportation improvements, extension of services and industrial site development. The program focuses on encouraging the expansion of present industries and a widening of the industrial base by attracting new industry to the area. Inherent to the program is the improvement of road facilities, bridge construction, development of a Port Authority, and extension of services for industrial and residential development, designed to improve the quality of life for present and future area residents.

## Cumberland Valley Area Development District

The Cumberland Valley Area Development District is an eight county region in southeast Kentucky with a population of about 215,000.

The potential of the area includes the I-75–U.S. 25E development corridor and a large share of Kentucky's coal reserves and production. Coal mining and processing is the most important economic sector of the Valley. Development of agriculture, tourism and manufacturing potentials is necessary to provide a balanced economy.

The lack of suitable land resources, industrial sites and transportation facilities continue to be the major development problems of the area.

Local efforts, with very little state support, have resulted in major increases in manufacturing jobs during the past fifteen years. The I-75 corridor had many visits from prospective industries in recent years but the towns have not had sites to sell as all of the available sites had been utilized.

Tourism and manufacturing are the growth industries of the area. This is largely due to increased emphasis on the promotion of these industries by local developers.

Coal has been a declining industry in the area. Government regulations have made it extremely difficult for the small operator and have forced many out of business. Regulations also affect the land owner with 20-50 acres of mineable coal; it also reduces from the marketplace competition for the large companies.

Agriculture has shown little change over the past ten years. Virtually all available agricultural land is in production and for the past ten years has been operated at a high level of use.

The major focus of the ADD is to enhance the area to produce economic growth through job expansion. It is believed that the area lags behind others of the state in receiving needed highway and public facilities' developments. The area plays a significant role in the economic life of the state but a vast potential has not been utilized. Some relatively small state investments would yield tremendous returns.

## Fivco Area Development District

The Fivco Area Development District reflects a situation in which the highly industrialized river-based counties of Boyd and Greenup create a sufficient market for the five county labor force. Unemployment in these two counties historically remains below the state

average. The counties of Carter, Elliott and Lawrence depend more on agriculture and small businesses and industry for their economic livelihood and also experience a higher rate of unemployment.

Fivco Area Development District's major development problem is a lack of developable land for industry. Pollution is a problem due to the highly industrialized area and to the burning of coal as a major source of energy. Population movements are fairly smooth with good access roads to I-64 which links east and west and U.S. 23 north and south.

However, another access needs to be opened from I-64 north to Greenup County and the Ohio River at Portsmouth where the new bridge spanning the Ohio River is complete.

All energy related industries in the District are expanding. The coal industry is now growing and will continue to grow as long as energy needs are critical nationwide. Transportation must expand at higher than projected rates if energy goals are to be met. Petroleum, coal, rubber, plastics and electrical equipment will be growth industries.

Forestry and agricultural employment is declining; however, small farms still produce beef, tobacco, hay and corn. Mining and manufacturing are projected to grow at rates even higher than the national average; as these industries generate high income for workers and proprietors. Other industries as services, wholesale/retail, finance, real estate and contract construction can also be expected to increase above average projections.

Industries expected to change slowly are communications and utilities, nondurable manufacturing and federal government. The services, wholesale and retail industries along with manufacturing are projected to remain strong although constant through the 1990s.

Recreational activities and tourism are expected to continue to grow in the Fivco District through the three major state parks and the addition of the Appalachian Cultural Park which is located in the outskirts of Ashland, U.S. 60 West. Development of lodging facilities at Grayson Lake State Park would complete the recreational triangle to provide services for all five of the Fivco counties. With the opening of the Appalachian Park's Jean Thomas Museum and Art Gallery, a new tourist attraction has been added to the area.

Fivco Area Development District's major focus is that of building stable self-sustaining communities. Strong emphasis is placed on coal and energy related industries; riverport development as a major source of transportation; improved health, aging and human services; and improved housing and land use development.

Fivco Area Development District has concentrated strong efforts to utilize the woodlands and forests existing in eastern Kentucky. Emphasis has also been on hiking trails through the development of the Jenny Wiley Trail. Both programs have received attention at the local, state and federal levels.

## Gateway Area Development District

The Gateway Area Development District, one of the smaller ADDs in terms of population, experienced a population increase of about 5.1 percent during the period 1970-75. Per capita income of the District in 1977 was $4,379.

Perhaps the most important economic characteristics of the ADD are the related conditions of high unemployment and a low per capita income.

The major development problems include inadequate access to parts of the District. There is also a lack of community infrastructure. In some areas prime agriculture land is being lost to development.

Tourism is a key growth industry primarily because of the development of Cave Run Lake.

Coal mining is a declining industry at this time because of a lack of demand. The agriculture sector is also experiencing a hardship as many farmers find it difficult to make an adequate living.

The manufacturing sector has shown little change over the past ten years. The number of new manufacturing industries for new jobs has been quite limited.

The major focus of the area development program includes job creation through locating new industries in the District, expansion of existing industries, expansion of tourism, and the creation of new markets for agriculture products. It also includes the development of adequate community infrastructure and suitable housing units for citizenry.

## Green River Area Development District

The Green River Area Development District represents a seven county area in northwest Kentucky with a population of about 193,000. Owensboro is the major population center, but the area is also affected by Evansville which is located across the Ohio River in Indiana.

The most noticeable or obvious sectors of production in GRADD are agriculture and coal and coal related industries, especially in some of the rural counties.

Per capita personal income is slightly below the state average; for the region as a whole, it has grown more rapidly than the state average in recent years, which is indicative of a basically strong and growing local economy.

The major development problems relates to the distribution of population and the need to minimize servicing costs. Several large construction projects are

planned, which could involve large short-term in-migration.

Coal has been a major growth industry; several projects are planned to process coal. The aluminum industry has also experienced recent expansion. In terms of income the greatest recent growth has been in durable goods, manufacturing, wholesale trade and construction.

No sectors of industries appear to be declining. Agriculture is remaining strong as a whole, yet fewer farmers are operating more of the land in production.

The major focus is to provide services to units of local government. The ADD offers technical assistance in the provision of basic services as well as growth management and planning for increased services to a growing population. The ADD is involved in planning areas for the encouragement of organized industrial and commercial expansion, through many avenues including a revolving industrial development loan fund. Also, there are ongoing efforts in the areas of transportation planning, health services planning, employment and training planning, services to the elderly (including a demonstration project designed to maintain the elderly in their homes as opposed to institutions), emergency services planning, water, sewer and solid waste disposal planning as well as services to local governments.

## Kentuckiana Regional Planning and Development Agency

The Kentuckiana Regional Planning and Development Agency (KIPDA) encompasses the major metropolitan area and largest employment and business center in the state. It is a urban area that incorporates land in two states (including Clark and Floyd Counties in Indiana) and serves an important transportation function as the focus of river, rail, air and highway transport. Louisville is the state's largest city; Jefferson is the state's most populous county. Bullitt and Oldham Counties are the fastest growing counties in the state.

The economy is diversified. The percent of area employment in manufacturing has been decreasing during the 1970s in comparison to employment in nonmanufacturing industries. However, in 1978, Jefferson County was the tenth ranked county in the nation in terms of value of total shipments of manufactured goods.

A major development problem for the region is air pollution. In addition, there is also the possibility of regulatory sanctions by the U.S. Environmental Protection Agency that lends a sense of uncertainty to the local development scene. Vigorous efforts are under way to enable the community to meet the 1987 clean air mandates in terms of both stationary and mobile sources of pollutants. Cooperation has been fostered in this vital effort and significant progress is anticipated.

Other problems include the decline in population, industrial jobs and tax base in the central city of Louisville; general outward movement of the population and dependence on commuting; and the need to preserve prime agricultural land, especially in the rural counties. Outmoded plant facilities in urban parts of the region often have no easy way to expand and modernize, leading to occasional major industry relocation into an outer county location or out of the region or the state.

The growth industries in the KIPDA region are in the nonmanufacturing area. Based on employment growth, service industries are the fastest growing of any local industry. Government employment is next, with education being the major component of this growth. Growth in the financial section of the financial, insurance and real estate category is marked, especially in the Kentucky counties.

Every classification within the nonmanufacturing class of employment has experienced growth in the 1970s. The reason for recent growth in the nonmanufacturing sector can be attributed to several causes. Louisville, as the largest city in the state, occupies a central place in terms of the Commonwealth's economy. Secondly, the location of the area on the Ohio River and along the chief north-south corridor to Chicago, Indianapolis and points south supports its role as a transportation and communication-linked economic activity center. The growth, further, is in line with national trends in major metropolitan areas toward an expanding service, retailing, and head office function.

The manufacture of both durable and nondurable goods has shown some decrease in employment since 1970. No one industry stands out as having sustained the brunt of the decreases or could be characterized as declining. Slow hire-backs after the 1974-75 recession have been cited as part of the decrease. However, productivity is not always affected by this decrease in employment, as more factories modernize and automate and workers' productivity is maintained or increased.

The major focus of the area development program has been on urban transportation planning for long-range development of highways and transit opportunities; air quality planning to meet the 1987 standards of the Clean Air Act; revitalization of downtown shopping/commercial areas in selected locations throughout the nine-county region; encouragement of local comprehensive planning to assess industrial land use needs and/or demands; and improvement of regional industrail/commercial land use information.

A continuing research program exists to chart the changes in population and household characteristics that may affect the job market and labor pool of the area. This activity includes close coordination with the U.S. Bureau of the Census. Other related planning and service activities involve housing, land use, solid waste,

government management services, health planning, health facilities review, coordination of a regional emergency medical services system, planning for services for the elderly, human resources and manpower planning and assistance, maintenance of data processing capabilities and other types of management expertise for use by local government.

Two areas of concern for the economy of the region are the effect of anticipated employment at the new Riverport in Jefferson County and the Clark Maritime Centre, and the effect of the Commonwealth's Workmen's Compensation Law. An area of interest for KIPDA is the capture potential of I-65 and I-71 expressways' through-traffic for increased tourism or regional facilities. An area worthy of continued monitoring and interest by the state is the continuing revitalization of downtown Louisville and the role of a vital and viable downtown Louisville as an improving setting for increasing service industry trends and for serving as a focus of urban activity for the Commonwealth.

## Kentucky River Area Development District

The Kentucky River Area Development District is an eight county area located in southeast Kentucky. The District had a 1977 per capita income of $4,262, somewhat below the state average. The area has a one industry economy, coal mining, which provides well over half of the private nonfarm income but which also has had historical ups and downs. Currently coal production is down due to inadequate demand and to various mining regulations which add several costs to coal production but do not add to its sales value.

If the nation is to see double or triple coal production in 1985, there will have to be more concerted effort toward housing and community facilities to serve a growing population in areas such as the Kentucky River ADD. The eight counties have grown by about 20,000 during the past ten years and had a 1978 population of about 125,600. A large share of the increased population is being housed in mobile homes. More development is needed in firms that support mine activities. There is some growth in firms which serve the mining industry which are beginning to be housed in the area and to employ local labor.

The major focus of the area development program is on housing and community facilities to serve a growing population.

Other perceived needs of the area are changes in mining regulations so they do not adversely effect the small operator, and Energy Impact funds for housing development to increase the housing stock within the District.

## Lake Cumberland Area Development District

The Lake Cumberland Area Development District, located in south central Kentucky, had a 1977 per capita income of $4,068. The Lake Cumberland ADD is developing a favorable balance of manufacturing, tourism, and agriculture. The ten-county area presently attracts approximately ten million visitors annually. The Big South Fork National Rivers and Recreation Area is now in the planning stages. This national park will complement such existing tourist attractions as Lake Cumberland, Green River Lake, Dale Hollow Lake, and the Cumberland Falls area. Approximately 3,000 manufacturing jobs have been added to the area over the past decade. In a survey of approximately 70 percent of the existing manufacturing concerns, employers indicated their great satisfaction with the quantity, quality, and trainability of the labor supply.

Although significant improvements have been made in the transportation system, much remains to be done to improve the accessibility of this area of Kentucky. An early completion of Appalachian Corridor J is essential. A modern, high speed highway is needed linking the area to the Louisville market. U.S. 127, which bisects the District north and south needs completion. The area has shown significant growth in population over the past decade. A regional industrial park of some 400 acres is presently being developed in Somerset, one of the region's growth centers. Anticipated growth in both tourism and manufacturing further accents the critical need for an adequate highway network to enable south central Kentucky to be more accessible to the rest of the state.

Light manufacturing continues to be a growth industry because of the availability of a good labor supply. The coal industry has grown in the three coal producing counties of the area; tourist related industries will continue to grow. From an agricultural point of view, dairy farming has made significant increases, and beef cattle production continues to rise.

The declining industries in this ADD are perhaps the same as elsewhere. The most significant decline is in the industries manufacturing components for the automobile industry. The building industry is also expected to undergo a temporary lull. Throughout the area, the needle trades industry has remained relatively constant over the past ten years.

The major focus of this Area Development District is economic development. However, there is concern that economic development be pursued without jeopardizing the natural beauty of the area. The ten counties and seventeen cities located in this 3,613 square mile area are primarily interested in attracting small

manufacturing concerns (300-400 workers), primarily employing men. Presently, approximately 70 percent of the manufacturing force is women. Economic development activities are dedicated to the effort of attempting to equalize manufacturing employment.

The counties and communities of the Lake Cumberland ADD operate to a high degree on the regional concept. A particular county or city pursuing a project or industrial prospect may expect the wholehearted support of all the neighboring counties in their effort. The communication among the particular local units of governments is excellent. Commuting to jobs or services from one county to the area is a long established practice.

## Lincoln Trail Area Development District

The Lincoln Trail Area Development District is one of the few ADDs that experienced a population loss during the first part of the 1970s. This was primarily due to a reduction in station strength at Fort Knox, however, during the latter half of the decade population increased significantly.

The area contains a diversified regional economic base. Manufacturing concentrations are situated at Bardstown, Elizabethtown and Leitchfield. The Fort Knox Military Installation is located within Hardin and Meade Counties, and the whiskey industries are located in Nelson and Marion Counties. Agribusiness and related industries are found in all eight counties of the District.

The major developmental problem of the Lincoln Trail ADD, associated with the attraction of new and the expansion of existing industry, is believed to focus upon high workmen's compensation rates and the manufacturing taxes on the whiskey industry. Furthermore, not all municipalities have sufficient wastewater treatment capacities, or industrial land with adequate streets, water and sewer lines.

Growth is particularly apparent in light manufacturing and assembly type industries. Expansion is believed to be the result of an available labor market which possesses the skills or which are trainable, excess capacities that do not require substantial amounts of water or treatment of wastewater, transportation accessibility to markets, moderately priced land, and active industrial groups.

Decline in the whiskey and related industries is believed to be primarily due to the state manufacturers' tax system and possibly workmen's compensation for timber related industries such as logging, stave mills and saw mills.

The major focus of the Lincoln Trail ADD development program is the attraction of clean industries to the local and multi-county industrial areas.

## Northern Kentucky Area Development District

The Northern Kentucky Area Development District covers eight counties in the northernmost part of the Commonwealth. During the period 1970-78, this ADD's population increased about 3.8 percent, with one county (Campbell) experiencing a population decline. The District's per capita income of $6,516 in 1977 was above average for the state.

One noticeable economic characteristic of the Northern Kentucky ADD is its diversity. The ADD is comprised of three urbanizing counties containing a multiplicity of industrial and commercial firms and five rural counties in which industrial growth has only begun. The rural counties, Gallatin, Grant, Pendleton, Owen and Carroll are ungoing a transition from the traditional agro-economy to systems that rely, at least in part, on manufacturing and other industrial activity. Of these five counties, Carroll is undergoing this transition at the quickest pace.

The primary development problem faced by the Northern Kentucky ADD is the lack of suitable industrial sites in the lower five counties. This problem stems from a lack of water and sewer lines, the size of the sites, transportation problems (lack of improved highways) and access (ingress-egress) to sites.

Another problem associated with the previous statement relates to the lack of rural area employers. Due to the small farmer having to supplement his income through employment in other commercial activities (manufacturing, retail trade, etc.) many persons commute into the more urbanized counties; trips of 50 miles or more are common. With the cost of energy and thus transportation constantly increasing, these persons are particularly affected in an adverse way by inflation.

During the period 1977-79 (using statistics for Boone, Campbell, and Kenton Counties) the biggest growth occurred in the contract construction industry. This is due to the increased need for housing resulting from the spill over from the highly inflationary Cincinnati housing market; it is cheaper to construct new homes in northern Kentucky. The second largest increase occurred in the wholesale and retail trade area. Other noteworthy increases have occurred in the finance, real estate and insurance industries, and in manufacturing.

It does not appear from Northern Kentucky ADD economic planning documents that any industries are on the decline. This is indicative of the general overall strength of the economy of northern Kentucky. Industries such as heavy manufacturing are increasing proportionate to population growth. This shows that the economy is in balance, but is overshadowed by the great increases in such areas as contract construction.

The transportation and communication industries have shown only slight increases. The major focus of the area development program has been on capital improvement programs, grantsmanship, and regional cooperation.

In conclusion the economy of the region is growing, both by the natural growth associated with population increases and in the provision of the Cincinnati Metropolitan area with housing at lower prices. Boone County is experiencing tremendous growth as a result of cheaper interest rates for mortgages on new single family construction and the increase in the number of acceptable industrial sites in the county. Additionally, this growth is beginning to spill over into adjacent Grant County. Carroll County is also experiencing significant industrial growth as the result of the movement of new industries into the county. In the future, economic growth may be spurred by Northern Kentucky Port Authority projects such as the Foreign Trade Zone currently in operation.

## Pennyrile Area Development District

The most noticeable economic characteristic of the Pennyrile Area Development District is the dependence of the local economy on government and mining both in terms of employment and sources of income. This dependence is highlighted by the steady growth of personal income from government which increased from $35 million in 1965 to $351 million in 1975 for a growth of approximately 1000 percent. The county most dependent on this income is Christian County because of the growth of military employment at Ft. Campbell.

Coal mining, the second largest source of personal income, dominates the economies of Muhlenberg and Hopkins Counties. This vital industry accounted for $99.8 million of the District's total personal income in 1975 as compared to $33.6 million in 1965.

The District is dependent on the federal government and its policies concerning mining regulations and military base operations. A reduction in funding for military spending and manpower programs in general could significantly affect the economy of the District. Also, more stringent requirements on air and water quality standards could cause a serious problem with the mining industry.

The dependency on these two industries requires more emphasis on the growth in manufacturing but the Pennyrile District is losing in its efforts to attract new manufacturing concerns to states with better workmen's compensation laws.

All sections of the District economy have shown substantial growth during the period from 1965 to 1975. However, government and mining show the greatest growth because of the substantial growth at Ft. Campbell since the end of the Vietnam War and the high demand for coal to meet the energy needs of the county. Manufacturing has had the smaller percentage of growth even though it ranks as the third largest source of income in the District.

All industries for the period from 1965-75 show growth in terms of income but agriculture shows a decrease as a source of employment. Agricultural income in 1975 totaled $76.5 million as compared to $28.9 million in 1965. Manufacturing shows a slower more gradual growth over the past ten years although it is the third largest industry in terms of income.

The major focus of the Pennyrile Area Development District development program is toward diversification of the district economy to reduce dependence on government and mining. To achieve this the District is working with local government to provide the facilities to attract new manufacturing concerns. Industrial parks have been developed in Hopkinsville, Eddyville and Princeton and an application has been filed with EDA for funds to develop an industrial park in Madisonville. Also, emphasis is directed toward the completion of transportation facilities which includes Interstate 24 and the important Lyon County Port Authority.

The development of the District's tourist industry is also an important element of the District development program.

## Purchase Area Development District

The Purchase Area Development District, located in the westernmost part of the Commonwealth, experienced a 4 percent population increase during the period 1970-75. Its per capita income in 1977 was $5,857, slightly below the state average.

Agribusiness is one of the growth industries as the area increasingly has been planted in corn, soybeans, wheat and milo. Storage, handling, custom farming, equipment sales and maintenance are becoming significant income producers while at the same time using the same or a smaller number of farm workers. Chemical plants, after a long period of stable activity, have announced building programs. Some of the newest plants in the Purchase Area have been in the metal products field ranging from forgings, rolling mills to metal scrap recycling. This is probably related to the existing excellent transportation network and future Tennessee Tombigbee linkages. Increasing barge traffic on the rivers is reflected in the development of two riverport facilities in the Purchase Area--one on the Ohio at Paducah, the other at Hickman on the Mississippi. Both ports are seeking river oriented industries.

Industries showing little change in recent years include a large uranium diffusion plant which has been

steadily increasing production without significantly adding to employment due to better technology. The declining industries in the ADD include clothing and shoe manufacture which have been affected by low-cost imported goods. Vegetable processing is also declining. Less land is devoted to vegetable production because hand labor is too high and the soil is not the best type for market gardening.

The major development problems of the Purchase Area are diverse. Many young people are moving from the District to urban centers in search of meaningful employment. The Illinois Central Gulf Railroad is attempting to close rail lines where they feel traffic cannot be maintained at an adequate profit level. The loss of branch lines sometimes means loss of industry in place and makes it difficult to locate new industry. McCracken County and Marshall County are nonattainment areas for several forms of air pollution. Industry must clean up their emissions; carpool, vanpool and mass transit must be encouraged to lower internal combuston engine emission levels. The Purchase Area has not been as fortunate as other areas in the so-called "sun belt" which have received many new industrial plants. Some counties within the Purchase are chronically high in unemployment but the quality of life steadily improves in others. This lack of consistent growth, although not unique to the Purchase ADD, certainly is the most noticeable economic characteristic.

The mission of the Purchase Area Development District is to strengthen the role of local government so that they can deal with their needs and problems. These local governments have endorsed an area development program which when implemented will "regionalize" the district economy in several ways. The interconnection, on a regional basis, of county water and sewer districts and municipal systems will be encouraged. Improvement of district water and wastewater treatment plants would also be encouraged. The capacity of sluggish land drainage systems must be improved on a regional basis. The amalgamated districts would then be operated more efficiently, maintained properly and have realistic rate structures. The result would be an increase in quantity, quality and reliability of potable water and fire protection as well as improving the quality of streams.

New industry will be recruited and sited on a regional basis. An Industrial Committee is seeking labor intensive plants for some counties and capital intensive plants for other counties.

A regional approach will be made on energy management. Passive and active solar energy applications, and conservation and weatherization measures on all existing and new buildings will be encouraged. Kentucky coal will be used wherever possible. Energy resources such as wood for fuel and the distillation of alcohol from grain or biomass for fuel will be encouraged. Cogenerating steam plants, especially if they are fueled with Purchase Area solid waste will be developed on a regional basis. Burning solid wastes in pollution free steam generators will eliminate the need for large sanitary landfill operations.

Regional training programs for the unemployed and underemployed will be encouraged. An example of this is the Purchase Training Center which will offer Advanced Diesel Mechanics training and Hydraulic repairs on its own site in 1980. This unique skills training center with its flexible programs will respond quickly to the needs of commerce and industry.

Other needs of the Purchase ADD go beyond the purely economic requirements. For example, the Purchase Area needs a regional jail. Adequate juvenile detention facilities need to be constructed in every county. Health facilities and especially physicians need to be provided in rural areas. Housing in general and low income housing in particular is in short supply.

The Excess Property Program, allowing local units of governments to use excess federal property, needs to be reinstated. The whole region benefited greatly from this program which saved taxpayers in the Purchase Area at least 1.5 million dollars.

Bridges on county maintained roads have deteriorated badly over the past several winters. A program of doing their own precast reinforced concrete bridges and a bridge technology used by Graves County, needs to be adopted by other counties with similar problems.

## Regional Analysis: Summary and Conclusions

An analysis of the Commonwealth from the perspective of each of the fifteen Area Development Districts makes a number of important and useful conclusions apparent. Certain economic conditions and development problems seem common to many ADDs; others are more uniquely applicable to one or a few Districts.

One problem that apparently affects many of the ADDs is the shortage or lack of industrial development sites. For whatever reason–unsuitable land, lack of facilities, inadequate access roads–many Districts have not been able to make acceptable space available for potential industrial users. A shortage of adequate housing is also a problem in many areas.

In some Districts, lack of economic diversification has created concern. This has been particularly true of areas where activity has centered on coal mining and processing.

Numerous other problems may be somewhat local in nature. In a few areas the loss of young people to the more urbanized Districts has been a major concern. In a few instances, concern over a disproportionally large share of female employment has been expressed. Poor

roads have been a serious problem in a few areas. Growth limitations that may arise as a result of pollution is a potential problem for a small number of Districts.

One condition that affects or is of concern to most areas relates to the degree of economic diversification. Generally those areas that have a good balance of activity in the primary sector, industry and the services have achieved a relatively high rate of economic growth. This includes a part or much of the Bluegrass ADD, KIPDA, Lincoln Trail ADD, and the Northern Kentucky ADD. Others that have been less diversified have generally not been as fortunate and there is an interest in changing the composition of productive economic activity.

Footnote

[1] Material in this chapter was assembled by Charles W. Hultman. Assistance in generating the material was provided by Mr. Jas Sekhon, Executive Director of the Bluegrass Area Development District, and Chairman, Kentucky Association of Area Development District Directors. The basic material for the various ADDs was provided by the following persons: Jack Eversole (Barren River); Joe McCauley and Ken Weaver (Big Sandy); Darrell Gilliam (Bluegrass); Tom Martin (Buffalo Trace); Gatliff Craig (Cumberland Valley); David Salisbury and Avalon Haight (Fivco); Ron Clark (Gateway); Tanya Gritz (Green River); Paul Townes (Kentucky River); Sara Creed (KIPDA); Pat R. Bell (Lake Cumberland); Cletis Hunt (Lincoln Trail); Gene Archbold (Northern Kentucky); John Adams and David W. Shore (Pennyrile); Sam Smith (Purchase).

# IV. Lexington – An Economic Perspective

by L. Randolph McGee and Richard Thalheimer*

## Introduction

Lexington-Fayette County is the focal point of economic activity in central Kentucky. Local commerce and industry provide employment opportunities to individuals in nearby counties as well as for local residents, and Lexington is the major retail trade and service center in central Kentucky. Because of its major influence on a much larger region, the Lexington-Fayette County economy is a very important part of the Kentucky economy.

During the seventies, expansion of the Lexington-Fayette County economy slowed somewhat from the rapid growth during the fifties and sixties. Nevertheless, the local economy kept pace with the state as a whole, and prospects for the next decade suggest continued growth.

In this article we examine some indicators of economic growth during the past decade, offer some explanations for the nature of growth and stability in the local economy, and present an outlook for growth in Lexington-Fayette County and the SMSA over the next decade.

## An Overview of the Seventies

The strong expansion of population and economic activity in the Lexington-Fayette County area during the 1950s and the 1960s tapered off in the 1970s. During the fifties and sixties several major new industries initiated operations in Fayette County bringing with them new employment opportunities. The direct impact of these new industrial plants, plus the indirect impact they had on inducing new business activity in related industries and in the services sectors, generated rapid growth in population and employment during the fifties and the sixties.

With the exception of FMC, no major industry was established in the Lexington-Fayette County area during the 1970s. The main sources of growth were expansion of existing industries and growth in the nonmanufacturing sector, particularly in the retail trade sector. The Lexington-Fayette County economy may have reached maturity during the seventies; if not, it rapidly approached such an economic state. The growth in the nonmanufacturing sector would be consistent with the pattern of growth in a mature economy.

Tobacco and horse sales, each an important part of the local economy, increased considerably during the seventies. From 1970 to 1978, tobacco sales increased from $58.5 million to almost $119 million, more than doubling; during the same period horse sales at auction increased at a much more rapid pace; from $35 million to $165 million. Public horse sales have now reached a dollar volume in excess of tobacco sales.[1]

Lexington showed some indications of being a desirable place for corporate headquarters. Several coal companies located their headquarters in Lexington during the seventies and one major oil company has indicated a desire to move its main office to Lexington.

Tourism—or more accurately, visitation—has been an important part of economic activity in Kentucky, and Lexington-Fayette County has benefited most from tourism in the central Kentucky region. Two major developments in the 1970s enhanced the economic impact of visitations: one was the establishment of the Convention Center in downtown Lexington and the other was the opening of the State Horse Park. Local businesses have responded well to the increased impact of visitations. Over 1,500 new hotel-motel rooms were added and numerous restaurants and other eating establishments were established during the past decade.

Lexington's downtown area underwent some major changes during the seventies. Most notable were the construction of a Hyatt Regency Hotel, the Lexington Convention Center, high-rise office buildings, and the renovations of Main and Vine Streets.

The current form of the local government is the result of a major event in the 1970s: In 1974 the City and County government merged to form the Lexington-Fayette Urban County Government. The local government recently completed an update of its Comprehensive Plan which provides local officials with guidelines that reflect the pattern of growth desired by Lexington-Fayette County citizens.[2]

*The authors are Director and Associate Director respectively of the Center for Real Estate and Land Use Analysis. Dr. McGee is also a Professor of Economics at the University of Kentucky.

Prior to 1973 the Lexington-Fayette County Standard Metropolitan Statistical Area (SMSA) consisted of Fayette County only. In 1973, the SMSA was expanded to include Fayette and five surrounding counties and now consists of Fayette, Bourbon, Clark, Jessamine, Scott, and Woodford Counties. Because some of the economic information used in this article is reported only by the SMSA, some of the tables that follow begin with the year 1973 rather than 1970.

## Population

One important measure of socioeconomic activity in a geographic location is its growth (or decline) in population, both in absolute and in relative terms. The trend in population for Fayette County over the period 1950-78 is given in Table 1.

**TABLE 1**

**POPULATION TREND FOR FAYETTE COUNTY AND THE STATE OF KENTUCKY 1950-78**

| Year | Fayette County Population | Kentucky Population | Fayette County as Percent of State |
|---|---|---|---|
| 1950 | 100,746 | 2,944,806 | 3.4 |
| 1960 | 131,906 | 3,041,000 | 4.3 |
| 1970 | 174,800 | 3,231,000 | 5.5 |
| 1975 | 186,300 | 3,391,000 | 5.5 |
| 1978 | 191,600 | 3,498,000 | 5.5 |

SOURCE: U.S. Bureau of the Census and University of Louisville, Urban Studies Center; Kentucky Economic Information System.

The increase in county population from 1950 to 1960 was a remarkable 31 percent, almost ten times that for the state as a whole (3.3 percent). The trend continued from 1960 to 1970 during which time the county population increased by 33 percent, or slightly greater than five times that for the state as a whole (6.2 percent). For the first nine years of the 1970s population growth continued to increase (9.6 percent) but at a lower rate than in the previous two decades and at a rate nearer that for the state as a whole (8.3 percent).

The relative gain in share of state population by Fayette County is shown in the last column of Table 1. In 1950 Fayette County contained 3.4 percent of the state's population, a figure which grew to 5.5 percent in the 1970s. As with the rate of increase relative to the state, the county's share of state population has tended to stabilize in this decade as the county has matured.

In 1970, the total population in the six counties currently included in the Lexington-Fayette County SMSA was 267,500; by 1978 the number was 299,700, a 12.0 percent increase. The percentage increase was the largest for Jessamine County (39.4 percent) and the smallest for Bourbon County (6.6 percent). With the exception of Bourbon County, the surrounding counties experienced a percentage increase in population greater than that experienced by Fayette County over the 1970-78 period. Fayette County, however, still has about 65 percent of the population in this SMSA.

## Employment

Estimates of total employment by sector are not available for Kentucky counties at present. Total employment figures by major category are available on an SMSA basis and the breakdown is given in Table 2. Using population figures from the 1970 census, Fayette County population represented 65 percent of the total SMSA population. Examination of Table 2 indicates that manufacturing employment has remained relatively stable at about 30,000 over the 1973-78 time period. On the other hand, nonmanufacturing employment increased from 88,900 to 111,700 or 26 percent over the same time span. Within this sector, retail trade, services, and government accounted for 75 percent of employment. Retail trade enjoyed the largest percent increase (37 percent) over the 1973 to 1978 period, growing from 19,000 in 1973 to 26,000 in 1978. The services sector showed almost identical growth from 19,300 in 1973 to 25,100 in 1978 for an increase of 30 percent. The largest nonmanufacturing employment sector, government, increased 19 percent from 27,600 in 1973 to 32,900 in 1978.

Shifts in distribution of employment in the SMSA over the six-year period (1973-78) and a comparison of the 1978 distribution with that of the state yields additional insight into the potential growth and stability of the [illegible] economy. The percent distribution of the labor force by major SIC classification is given in Table 3. Manufacturing employment over the six-year period decreased slightly from 25 percent to 21 percent of total nonagricultural employment. Retail trade exhibited the largest gain in share of employment in the nonmanufacturing sector, increasing from 16.1 to 18.3 percent. The government sector, largest of all nonmanufacturing employment sectors, remained stable at approximately 23 percent of total employment. The distribution of SMSA employment in 1978 when compared to that for the state (the last column in Table 3) is quite similar. Presence of a larger government sector, 23 percent for the SMSA and 19 percent for the state, has tended to lend stability to employment for this region.

As of 1978 the Fayette County SMSA total nonagricultural employment represented 10.3 percent of the state total. The stability of the Fayette County labor force relative to that of the state and nation is shown by

TABLE 2

LEXINGTON-FAYETTE COUNTY SMSA
EMPLOYMENT BY SIC CODE
(In Thousands)

| | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 |
|---|---|---|---|---|---|---|
| Total Nonagricultural | 117.9 | 121.1 | 120.8 | 127.6 | 133.0 | 142.0 |
| Manufacturing | 29.0 | 29.7 | 26.5 | 28.8 | 29.4 | 30.3 |
| Nondurable | 8.4 | 8.3 | 7.5 | 8.1 | 7.5 | 7.4 |
| Durable | 20.6 | 21.1 | 19.0 | 20.7 | 21.9 | 22.9 |
| Nonmanufacturing | 88.9 | 91.7 | 94.3 | 98.3 | 103.6 | 111.7 |
| Contract Construction | 7.0 | 7.1 | 6.3 | 6.7 | 6.9 | 7.7 |
| Transportation, Communication and Public Utilities | 5.6 | 5.9 | 5.6 | 5.6 | 6.2 | 6.7 |
| Wholesale Trade | 5.6 | 5.3 | 5.6 | 5.5 | 5.9 | 6.5 |
| Retail Trade | 19.0 | 20.0 | 20.7 | 23.0 | 24.2 | 26.0 |
| Finance, Insurance and Real Estate | 4.8 | 5.2 | 5.4 | 5.7 | 6.3 | 6.8 |
| Services and Mining | 19.3 | 19.8 | 21.4 | 22.2 | 23.3 | 25.1 |
| Government | 27.6 | 28.4 | 29.4 | 30.1 | 30.7 | 32.9 |

SOURCE: *Labor Area Summary*, Lexington SMSA, Department for Human Resources, Bureau for Manpower Services.

TABLE 3

LEXINGTON-FAYETTE COUNTY SMSA AND KENTUCKY
(Percentages)

| | Lexington-Fayette County SMSA | | Kentucky |
|---|---|---|---|
| | 1973 | 1978 | 1978 |
| Total Nonagricultural | 100.0 | 100.0 | 100.0 |
| Manufacturing | 24.6 | 21.3 | 23.5 |
| Nondurable | 7.1 | 5.2 | 10.0 |
| Durable | 17.5 | 16.1 | 13.5 |
| Nonmanufacturing | 75.4 | 78.7 | 76.3 |
| Contract Construction | 5.9 | 5.4 | 5.5 |
| Transportation, Communication and Public Utilities | 4.8 | 4.7 | 5.5 |
| Wholesale Trade | 4.8 | 4.6 | 5.1 |
| Retail Trade | 16.1 | 18.3 | 16.4 |
| Finance, Insurance and Real Estate | 4.1 | 4.8 | 4.0 |
| Services and Mining | 16.4 | 17.7 | 20.6* |
| Government | 23.4 | 23.2 | 19.1 |

*Mining represents 4.3 percent.

SOURCE: Percentages computed using data from Kentucky Department for Human Resources, Bureau for Manpower Services.

examination of Table 4 which gives unemployment rates for the three regions for the 1970s. For each year of the nine-year period the county's unemployment rate was below that of the state and nation. Another indication of the relative stability of the county's economy can be seen when comparing unemployment figures for 1975, the low point of the recent recession. In that year the unemployment rate in Fayette County was approximately half that for the nation and slightly greater than half that for the state.

TABLE 4

UNEMPLOYMENT RATES FOR FAYETTE COUNTY, KENTUCKY AND UNITED STATES, 1970-78

| Year | Fayette County | Kentucky | U.S. |
|---|---|---|---|
| 1970 | 2.7 | 4.4 | 4.9 |
| 1971 | 3.2 | 5.2 | 5.9 |
| 1972 | 3.7 | 5.9 | 5.6 |
| 1973 | 2.2 | 3.7 | 4.9 |
| 1974 | 2.6 | 4.5 | 5.6 |
| 1975 | 4.1 | 7.3 | 8.5 |
| 1976 | 3.4 | 5.6 | 7.7 |
| 1977 | 3.0 | 4.6 | 7.0 |
| 1978 | 3.3 | 5.3 | 6.0 |

SOURCE: Kentucky Labor Force Estimates, Department for Human Resources, Bureau for Manpower Services, and Kentucky Economic Information System.

## Personal Income

Personal income is an important measure of economic well-being. Personal income for the Lexington-Fayette County SMSA, and Kentucky for available years in the 1970s are given in Table 5.

The average annual rate of growth for the Lexington-Fayette County SMSA over the seven-year period covered in the 1970s was 11.4 percent which is slightly greater than the 11.1 percent growth rate for the state over the same period. The SMSA's share of state income has remained relatively constant at approximately 11 percent.

In 1977 personal income in Fayette County was $1,308,640, representing 76 percent of the six-county SMSA total. In the discussion which follows, change and distribution of personal income for Fayette County alone will be examined. Table 6 presents the trend in total personal income by place of work for Fayette County from 1972 to 1977, the latest year for which information is available. Examination of this table reveals that while farm income remained relatively constant over the six-year period, nonfarm income increased 68 percent from $770,954 in 1972 to $1,294,690 in 1977. Sectors exhibiting growth greater than 68 percent were: durable goods manufacturing at 76 percent; transportation and public utilities at 74 percent; wholesale trade at 110 percent; retail trade at 75 percent; finance, insurance and real estate at 80 percent; and services at 82 percent.

The distribution of personal income by major SIC category for Fayette County is given in Table 7 for the years 1972 and 1977. Examination of the table reveals no major shifts in employment over that time span. Sectors which contain more than 10 percent of total personal income are, in decreasing order: nondurable manufacturing (17.4 percent); services (16.9

TABLE 5

TOTAL PERSONAL INCOME BY PLACE OF WORK LEXINGTON-FAYETTE COUNTY SMSA AND KENTUCKY

| Year | SMSA ($ Millions) | Percent Change Over Previous Year | State ($ Millions) | Percent Change Over Previous Year | SMSA as Percent of State |
|---|---|---|---|---|---|
| 1971 | 905,151 | – | 8,414,000 | – | 10.8 |
| 1972 | 1,026,871 | 13.4 | 9,361,148 | 11.2 | 11.0 |
| 1973 | 1,151,329 | 12.2 | 10,528,941 | 12.4 | 10.9 |
| 1974 | 1,249,243 | 8.5 | 11,788,313 | 12.0 | 10.6 |
| 1975 | 1,340,500 | 7.3 | 12,442,652 | 5.6 | 10.8 |
| 1976 | 1,561,361 | 16.5 | 14,097,957 | 13.3 | 11.1 |
| 1977 | 1,721,327 | 10.2 | 15,794,066 | 12.0 | 10.9 |

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

TABLE 6

TOTAL PERSONAL INCOME BY PLACE OF WORK
FAYETTE COUNTY, 1972-77
(Thousands of Dollars)

| | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|---|
| Total Labor and Proprietors' Income By Place of Work | 784,446 | 878,576 | 952,512 | 1,038,217 | 1,182,060 | 1,308,642 |
| Farm | 13,492 | 15,260 | 8,047 | 10,571 | 13,506 | 13,952 |
| Non-Farm | 770,954 | 863,316 | 944,465 | 1,027,646 | 1,168,554 | 1,294,690 |
| Private | 576,115 | 654,291 | 713,087 | 777,375 | 898,043 | 1,003,554 |
| Agricultural Services, Forestry and Other | N/A | 3,770 | 4,595 | 5,079 | 4,310 | 4,295 |
| Mining | N/A | 1,923 | 5,462 | 6,610 | 7,023 | 7,579 |
| Contract Construction | 63,026 | 68,509 | 73,292 | 77,629 | 91,312 | 101,861 |
| Manufacturing | 179,036 | 209,455 | 225,527 | 231,410 | 257,937 | 289,195 |
| Durables | 128,941 | 154,797 | 168,551 | 179,012 | 199,318 | 227,315 |
| Nondurables | 50,095 | 54,658 | 56,976 | 52,398 | 58,619 | 61,880 |
| Transportation and Public Utilities | 44,679 | 48,563 | 55,376 | 58,636 | 67,770 | 77,775 |
| Wholesale Trade | 36,687 | 41,909 | 48,397 | 68,016 | 70,913 | 77,257 |
| Retail Trade | 85,272 | 95,289 | 105,076 | 112,880 | 134,546 | 149,573 |
| Finance, Insurance and Real Estate | 41,666 | 43,997 | 49,211 | 51,581 | 65,692 | 74,962 |
| Services | 121,619 | 140,876 | 146,151 | 165,534 | 198,540 | 221,057 |
| Government | 194,839 | 209,025 | 231,378 | 250,271 | 270,511 | 291,136 |
| Federal, Civilian | 76,661 | 80,067 | 87,449 | 87,693 | 93,280 | 97,764 |
| Federal, Military | 2,314 | 2,406 | 2,498 | 2,545 | 2,444 | 2,621 |
| Federal, State and Local | 115,864 | 126,552 | 141,431 | 160,033 | 174,787 | 190,751 |

N/A = not available.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis; Kentucky Economic Information System.

percent); state and local government (14.6 percent); and retail trade (11.4 percent).

Growth of total personal income in Fayette County is shown in Table 8 for selected years. The average annual growth rate for Fayette County from 1971 to 1977 was 10.6 percent–slightly less than that for the state over the comparable period. Fayette County's share of state personal income has remained fairly constant at about 8.3 percent during the 1970s, and increased slightly from 7.5 percent in 1959.

Per capita personal income is an important measure of wealth and its trend for both the county and state over the 1959-77 time period is given in Table 9. Per capita personal income in Fayette County has been consistently greater than that of the state for each of the selected years in the 19-year time span. Although the trend seems to be slightly decreasing, Fayette County's per capita personal income in 1977 was still 20 percent greater than the state average.

## Retail Trade

Retail trade is one of the major areas of activity in the Fayette County economy. For this reason a more detailed examination of this sector might be informative. One of the most accurate measures of trade activity in Kentucky counties is general sales and use tax collections. The major item excluded from the tax is food, which was exempted in 1972. The tax is a flat rate tax of 5 percent of taxable sales. General sales and use tax collections for Fayette County from 1973 to 1977 are given in Table 10.

Fayette County's share of retail business is approximately 10 percent and has remained fairly constant over the seventies. When this is related to the fact that Fayette County contained 5.5 percent of the state population in the seventies (Table 1), it can be seen that the county is a major trade center in the state.

## Housing

Another sector of the Fayette County economy showing pronounced growth in the seventies was the housing market. This is shown in Table 11 which gives the trend in average price of houses sold through the Multiple Listing Service in Fayette County from 1971-78.

The total increase in average price of houses sold over the 8-year period was 107 percent. The average of the annual yearly increases was 11 percent, demonstrating the escalation of prices due to inflation and rapid expansion of population in the county.[3]

TABLE 7

DISTRIBUTION OF TOTAL PERSONAL INCOME BY PLACE OF WORK
FOR FAYETTE COUNTY, 1972 AND 1977
(Percentages)

| | 1972 | 1977 |
|---|---|---|
| Total Labor and Proprietors' Income By Place of Work | 100.0 | 100.0 |
| Farm | 1.7 | 1.1 |
| Non-Farm | 98.3 | 98.9 |
| Private | 73.4 | 76.7 |
| Agricultural Services, Forestry and Other | (D) | 0.3 |
| Mining | (D) | 0.6 |
| Construction | 8.0 | 7.8 |
| Manufacturing | 22.8 | 22.1 |
| Durables | 16.4 | 17.4 |
| Nondurables | 6.4 | 4.7 |
| Transportation and Public Utilities | 5.7 | 5.9 |
| Wholesale Trade | 4.7 | 5.9 |
| Retail Trade | 10.9 | 11.4 |
| Finance, Insurance, and Real Estate | 5.3 | 5.7 |
| Services | 15.5 | 16.9 |
| Government | 24.9 | 22.3 |
| Federal, Civilian | 9.8 | 7.5 |
| Federal, Military | 0.3 | 0.2 |
| State and Local | 14.8 | 14.6 |

(D) = Not disclosed.

SOURCE: Percentages computed using data from U.S. Department of Commerce, Bureau of Economic Analysis; Kentucky Economic Information System.

TABLE 8

TOTAL PERSONAL INCOME BY PLACE OF WORK
FAYETTE COUNTY, SELECTED YEARS

| Year | Fayette (In Thousands) | Percent Change Over Previous Year | Percent Fayette to State |
|---|---|---|---|
| 1959 | $ 257,643 | – | 7.5 |
| 1970 | 646,199 | – | 8.3 |
| 1971 | 696,478 | 7.8 | 8.3 |
| 1972 | 784,446 | 12.6 | 8.4 |
| 1973 | 878,576 | 12.0 | 8.3 |
| 1974 | 952,512 | 8.4 | 8.1 |
| 1975 | 1,038,217 | 9.0 | 8.3 |
| 1976 | 1,182,060 | 13.9 | 8.4 |
| 1977 | 1,308,642 | 10.7 | 8.3 |

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis; Kentucky Economic Information System.

TABLE 9

PER CAPITA PERSONAL INCOME,
FAYETTE COUNTY AND KENTUCKY

| Year | Per Capital Personal Income | | Ratio of Fayette to Kentucky |
|---|---|---|---|
| | Fayette | Kentucky | |
| 1959 | $2,140 | $1,563 | 1 37 |
| 1970 | 3,740 | 3,121 | 1.20 |
| 1975 | 5,812 | 4,927 | 1.18 |
| 1977 | 7,221 | 6,020 | 1.20 |

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis; Kentucky Economic Information System.

TABLE 10

SALES AND USE TAX COLLECTIONS FOR FAYETTE COUNTY AND KENTUCKY

| Year | Sales and Use Tax (In Thousands) Fayette | State | Fayette as Percent of State |
|---|---|---|---|
| 1973 | $29,514 | $301,659 | 9.8 |
| 1974 | 34,015 | 343,111 | 9.9 |
| 1975 | 36,914 | 371,327 | 9.9 |
| 1976 | 41,996 | 419,189 | 10.0 |
| 1977 | 47,979 | 486,558 | 9.9 |

SOURCE: Kentucky Department of Revenue, *Annual Reports.*

Building permits issued are an indication, albeit a crude one, of strength in the new housing market. Residential building permits issued in Fayette County for the 1970s are given in Table 12.

The trend in new residential housing permits is irregular over the time span but appears to be relatively stable with the exception of the recession years of late 1973, 1974 and 1975. Multi-family building permits exhibit very erratic behavior primarily due to the nature of the data since application for permits for a few new large apartment complexes can drastically affect the totals of a given year.

## Outlook for the Eighties

The Lexington-Fayette County economy is a mature economy, or at least one that is rapidly approaching maturity, and the nature of its growth and development in the eighties will reflect this stage of development. Most of the growth will occur in the retail trade, services industries, and finance, insurance, and real estate sectors.

The tobacco and equine industries, which have been an important part of the local economy, will continue to have an important impact on the local economy. Some new manufacturing will no doubt enter the local economy, but most of the new manufacturing employment will come from expansion of existing industry.

Visitations–tourism and conventions–will have an increasing impact on the local economy. Potentially, this could be the strongest component of economic activity in Lexington-Fayette County.

Lexington-Fayette County will continue to have a cyclically stable economy. This is because of the employment composition of which is heavily influenced by stable government employment and cyclically stable firms such as IBM. The growing importance of services will further assure relative cyclical stability.

Population growth is influenced largely by available economic opportunities. The economic outlook, therefore, suggests a moderate increase in population during the next decade. Although they differ considerably in the actual figures, most projections reflect population increases over the next decade for Lexington-Fayette County (and the local SMSA) at a rate slightly less than that experienced over the past decade.

TABLE 11

AVERAGE RESIDENTIAL SALES PRICE

| Year | Average Value | Percent Increase Over Previous Year |
|---|---|---|
| 1971 | $23,942 | |
| 1972 | 24,715 | 3.2 |
| 1973 | 28,952 | 17.1 |
| 1974 | 32,463 | 12.0 |
| 1975 | 35,918 | 10.6 |
| 1976 | 39,260 | 9.3 |
| 1977 | 43,028 | 9.6 |
| 1978 | 49,489 | 15.0 |

SOURCE: Lexington Board of Realtors, Multiple Listing Service.

TABLE 12

NUMBER OF RESIDENTIAL BUILDING PERMITS ISSUED, FAYETTE COUNTY

| Year | Single Family Units | Multi-Family Units | Total Units |
|---|---|---|---|
| 1970 | 1,325 | 1,065 | 2,282 |
| 1971 | 1,142 | 2,575 | 3,897 |
| 1972 | 1,190 | 930 | 2,227 |
| 1973 | 1,111 | 564 | 1,438 |
| 1974 | 851 | 525 | 1,376 |
| 1975 | 874 | 1,069 | 2,180 |
| 1976 | 1,297 | 2,054 | 3,244 |
| 1977 | 1,321 | 2,019 | 3,161 |
| 1978 | 1,217 | 1,779 | 3,104 |

SOURCE: Lexington-Fayette Division of Building Inspection.

Footnotes

[1]We wish to thank Mr. Ed Sturgeon, Lexington Chamber of Commerce, for providing information on tobacco and horse sales.

[2]*Comprehensive Plan for Lexington-Fayette Urban County, Growth Planning System Plan Update*, Lexington-Fayette Urban County Government, Division of Planning, September 1979.

[3]Part of the increase in the price of housing is due to changes in the characteristics of houses sold. See Michael G. Ferri and L. Randolph McGee, *Measuring Housing Prices: A Discussion and Illustration of Selected Approaches*, Center for Real Estate and Land Use Analysis, Office for Research, College of Business and Economics, University of Kentucky, September 1978.

[4]Three articles in the December 30, 1979 issue of the *Lexington Herald-Leader* contain views of various individuals concerning the outlook for the local economy in the 1980s. See the following articles: John Fuller, "Local Businessmen Hoping '70s Boom Will Continue," Ray Cohn, "Kentucky's Leaders Optimistic, But Worried," and Jim Jordan, "Lexington in 1990: A Lot Like Lexington Now."

# V. Louisville—An Economic Perspective

by James R. McCabe*

Louisville's economic region includes both the city and some of the surrounding parts of Indiana and Kentucky. This area can be defined as consisting of the Louisville Standard Metropolitan Statistical Area (SMSA), which includes the Kentucky counties of Jefferson, Bullitt, and Oldham and the Indiana counties of Clark and Floyd. This article examines trends in this economic area, and in order to distinguish local strengths and weaknesses and to assess Louisville's stage of economic development, this area will be compared to a hypothetical, somewhat idealized urban economy.

Serious challenges to the growth and development of the area have resulted in light of the loss of population in the city of Louisville and Jefferson County within the past ten years. In addition to the loss of population, there has been a decline in manufacturing employment in Jefferson County and the entire SMSA as well. As a result, erosion in the tax base generates concern for the long-term development and health of the center of this economic region. Furthermore, retail activity in the Central Business District has fallen off as retail business moved to the outlying areas.

Not only has there been deterioration in the trend of manufacturing employment, the Louisville economy has become less insulated from cyclical swings in the economy. In the past, Louisville's diversification of business aided in keeping the impact of cyclical downturns less severe locally than for the U.S. as a whole. In the two most recent recessions, however, Louisville's downturns have been more severe than those for the rest of the nation.

The exodus of population from Louisville and Jefferson County is consistent with the decline in manufacturing employment, reflecting economic and social changes typical of many urban regions. Nevertheless, total employment in the Louisville SMSA has increased during the past decade, the result of extraordinary gains in the service-producing areas.

The demographic and economic changes that have occurred within the last ten years have caused concern to local government officials regarding the fiscal health of the Louisville area. Decline in growth of real property taxes, especially for commercial and industrial property, has been a major factor. Local business leaders and government officials have been aware of these events. Actions during the past ten years have focused on a coordinated effort of rebuilding the Central Business District through the construction of a downtown mall, attracting the Hyatt Regency Hotel, building a convention center, and Belvedere Plaza along the riverfront. In spite of these actions, attraction of new or retention of previously established retail outlets has not met with the success initially desired or planned. Thus, crucial to successful redevelopment of the Central City is the forthcoming Galleria, renovation of the Seelbach Hotel, and Riverfront Square.

Only recently has there been a concerted effort to attract and retain industry in Louisville. In addition, the overall economic plan must consider the commercial and residential communities that surround the Central Business District.

In comparison to the economic success or demise of other urban areas within the United States, the city of Louisville can be considered to have reached at least middle age when contrasted to an old or young city. One of the most important considerations is the ability to expand geographically, thereby retaining a tax base to provide services demanded by the community. In this case, Louisville is essentially land locked, surrounded by smaller, incorporated cities.

Furthermore, available property for additional industry within the city limits is extremely limited. As a result, new industry successfully attracted to the Louisville area primarily will be located outside the city of Louisville. Given the energy situation, employees of new industry would most likely reside near their location of employment. Thus, even if the attraction of new industry is successful, it is unlikely that the trend of employment and residence away from the city would be reversed.

Because the attraction of new business to any area is dependent upon consideration of the perceived and actual well-being of the entire area as well as the economic advantages, the interrelationship among the various government and economic units in the entire

*The author is Associate Professor of Finance and Acting Director of the Bureau of Business and Economic Research and Service, School of Business, University of Louisville.

area is especially important. It is quite improbable that an economic region containing a deteriorating and fiscally unhealthy core or center would be considered attractive to those considering the area for possible location.

As a result, coordination among government units to consider the entire economic area as a unit is essential. Furthermore, the economic function of the city of Louisville as the heart of the entire economic area must be assessed in light of its relationship with the surrounding area.

## Trends and Developments in the 1970s

During the past decade, the Louisville SMSA has experienced a change in the composition of employment similar to that of the United States. Specifically, as shown in Table 1, manufacturing employment, both in the durable and nondurable areas, has declined in importance while service-producing industries have increased in their share of total employment in the Louisville region. In fact, the percentage increase in service-producing employment in Louisville has been greater than the respective increase in the United States, resulting in a manufacturing-service composition in Louisville more similar to that of the entire country than what was registered in 1970 (Tables 2 and 3).

Most important, the Louisville SMSA has suffered an absolute decline in manufacturing employment since 1974, where the loss resulting from the 1973-75 recession has never been fully recovered (Table 4). A comparison of employment near its peak in the last business cycle to the approximate employment peak of the current business cycle, reveals the negative trend that has developed in recent years. In absolute terms, the largest employment reductions have occurred in fabricated metal products, machinery (including electrical), tobacco manufactures, furniture and fixtures and food and kindred products.

In this case, General Electric has gone through a period of improving its cost effectiveness by consolidating many job functions and therefore eliminating numerous positions as well as restraining employment growth. Also, Brown and Williamson has decided to move its operations from Louisville to Macon, Georgia, resulting in the layoff so far of about half of the 3,000 employees that will lose employment with that firm by 1981.

In total, manufacturing employment has declined 12,400 from September 1974 to September 1979. Alternatively, major gains in employment in wholesale and retail trade, services, and government have contributed to the 54,400 increase in service producing employment since September 1974.

## Cyclical Experiences

Diversification of employment in the Louisville

TABLE 1

LOUISVILLE SMSA NONAGRICULTURAL WAGE AND SALARY EMPLOYMENT[1]
(In Thousands)

| Year | Total | Manufacturing | | Contract Construction | Service Producing[2] |
|---|---|---|---|---|---|
| | | Durable | Nondurable | | |
| 1960 | 245.0 (100.0)[3] | 43.9 (17.9) | 41.5 (16.9) | 12.9 (5.3) | 146.6 (59.8) |
| 1970 | 335.1 (100.0) | 70.4 (21.0) | 45.9 (13.7) | 15.9 (4.7) | 203.0 (60.6) |
| 1971 | 330.5 (100.0) | 63.7 (19.3) | 43.4 (13.1) | 15.7 (4.8) | 207.7 (62.8) |
| 1972 | 345.8 (100.0) | 67.2 (19.4) | 45.4 (13.1) | 18.2 (5.3) | 214.9 (62.1) |
| 1973 | 362.5 (100.0) | 72.8 (20.1) | 46.6 (12.8) | 18.7 (5.2) | 224.4 (61.9) |
| 1974 | 368.1 (100.0) | 74.5 (20.2) | 46.1 (12.5) | 18.0 (4.9) | 229.5 (62.3) |
| 1975 | 350.5 (100.0) | 61.5 (17.5) | 43.5 (12.4) | 15.8 (4.5) | 229.7 (65.5) |
| 1976 | 356.8 (100.0) | 59.7 (16.7) | 44.0 (12.3) | 15.8 (4.4) | 237.5 (66.5) |
| 1977 | 372.1 (100.0) | 63.4 (17.0) | 43.6 (11.7) | 17.6 (4.7) | 247.4 (66.5) |
| 1978 | 393.7 (100.0) | 65.7 (16.7) | 44.0 (11.2) | 20.1 (5.1) | 263.9 (67.0) |
| 1979[4] | 409.7 (100.0) | 66.4 (16.2) | 42.9 (10.5) | 20.6 (5.0) | 279.9 (68.3) |

[1] Employment data are annual averages of monthly figures for the Louisville SMSA including Bullitt, Jefferson, and Oldham Counties in Kentucky and Clark and Floyd Counties in Indiana.
[2] Service producing industries include (1) transportation, communication, and utilities, (2) wholesale and retail trade, (3) finance, insurance, and real estate, (4) services, (5) government, and (6) other nonmanufacturing.
[3] Figures in parentheses are percentages of total employment for that year.
[4] Employment data in 1979 are averages through September.

SOURCE: Kentucky Department for Human Resources.

TABLE 2

COMPOSITION OF NONAGRICULTURAL EMPLOYMENT,
LOUISVILLE SMSA AND UNITED STATES[1]
(In Thousands)

| | Total Employment | | Manufacturing | | Construction | | Service Producing[2] | |
|---|---|---|---|---|---|---|---|---|
| Year | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. |
| 1960 | 245.0 | 54,189 | 85.4 | 16,796 | 12.9 | 2,926 | 146.6 | 33,755 |
| | (100.0)[3] | (100.0) | (34.9) | (31.0) | (5.3) | (5.4) | (59.8) | (62.3) |
| 1970 | 335.1 | 70,593 | 116.3 | 19,349 | 15.9 | 3,381 | 203.0 | 47,242 |
| | (100.0) | (100.0) | (34.7) | (27.4) | (4.7) | (4.8) | (60.6) | (66.9) |
| 1975 | 350.5 | 76,945 | 105.0 | 18,223 | 15.8 | 3,525 | 229.7 | 54,345 |
| | (100.0) | (100.0) | (30.0) | (23.8) | (4.5) | (4.6) | (65.5) | (70.6) |
| 1979[4] | 409.7 | 88,514 | 109.3 | 20,885 | 20.6 | 4,545 | 279.9 | 62,154 |
| | (100.0) | (100.0) | (26.7) | (23.6) | (5.0) | (5.1) | (68.3) | (70.2) |

[1] For definition of Louisville SMSA, see Footnote 1 of Table 1.
[2] For service producing industries, see Footnote 2 of Table 1.
[3] Figures in parentheses are percentages of total employment in Louisville and the U.S., respectively.
[4] Employment data in 1979 are averages through September.

SOURCE: Kentucky Department for Human Resources and U.S. Department of Labor.

SMSA has generally been considered beneficial to the local economy in that unemployment rates for the Louisville SMSA have consistently been lower than U.S. unemployment rates. Furthermore, diversification of employment reduces the risk of significant layoffs during an economic downturn and generates more stable employment conditions over time. However, this diversification has not insulated the Louisville area from economic recessions. In fact, as shown in Table 5, the percentage rate of employment declines in both of the last two recessions indicate that the Louisville area suffered proportionally more than did the entire U.S.

Furthermore, Table 6 reveals that the differences between the unemployment rates in the U.S. and in the Louisville area declined during the 1970 and 1973-75 recessions. In addition, in the past as the economy has rebounded from a recession, the disparity between the U.S. unemployment rate and the Louisville SMSA unemployment rate increases. That is, unemployment has dropped relatively more in Louisville than in the U.S. when experiencing economic recovery. However, since 1976, when the economy has been quite strong except for the second quarter of 1979, there has been little change in the percentage difference between U.S. and Louisville unemployment rates. In fact, the difference has begun to decline in the past year.

The implication is that the Louisville economy is entering or has entered a new stage of economic development. Furthermore, where Louisville has lagged the economy in the past in economic downturns, employment data indicate that Louisville's peak was coincidental to the U.S. peak in 1974 and may be leading the U.S. in the current expected downturn. In any case, the most important consideration is the fact that there has

TABLE 3

ANNUAL RATES OF CHANGE IN EMPLOYMENT,
LOUISVILLE SMSA AND UNITED STATES

| | Total Employment | | Manufacturing | | Construction | | Service Producing | |
|---|---|---|---|---|---|---|---|---|
| Period | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. |
| 1969-70 | 3.2% | 2.7% | 3.1% | 1.4% | 2.1% | 1.5% | 3.3% | 3.8% |
| 1970-79 | 2.3 | 2.5 | -0.7 | 0.9 | 2.9 | 3.3 | 3.6 | 3.1 |
| 1970-75 | 0.9 | 1.7 | -2.0 | -1.1 | -0.0 | 0.8 | 2.5 | 2.8 |
| 1975-79 | 4.0 | 3.6 | 1.0 | 3.3 | 6.9 | 6.6 | 5.1 | 3.4 |

SOURCE: Kentucky Department for Human Resources and U.S. Department of Labor.

TABLE 4

EMPLOYMENT CHANGES IN LOUISVILLE SMSA BY MAJOR CLASSIFICATIONS, SEPTEMBER 1974 TO SEPTEMBER 1979
(In Thousands)

| Industry Classification | September 1974 | September 1979 | Arithmetic Change | Percentage Change |
|---|---|---|---|---|
| Lumber and Wood Products | 5.1 | 4.4 | -0.7 | -13.7% |
| Furniture and Fixtures | 3.1 | 1.4 | -1.7 | -54.8 |
| Stone, Clay, Glass Products | 2.3 | 2.4 | 0.1 | 4.3 |
| Fabricated Metal Products | 14.1 | 9.8 | -4.3 | -30.5 |
| Machinery Including Electrical | 37.4 | 33.3 | -4.1 | -11.0 |
| Transportation Equipment | 8.5 | 10.3 | 1.8 | 21.1 |
| Other Durable Goods | 4.3 | 4.3 | 0.0 | 0.0 |
| Total Durable Goods | 74.8 | 65.8 | -9.0 | -12.0 |
| Food and Kindred Products | 12.4 | 10.8 | -1.6 | -12.9 |
| Tobacco Manufacturers | 11.0 | 8.8 | -2.2 | -20.0 |
| Apparel and Related Products | 2.5 | 2.3 | -0.2 | -8.0 |
| Printing and Publishing | 6.8 | 7.4 | 0.6 | 8.8 |
| Chemicals and Allied Products | 9.4 | 9.3 | -0.1 | -1.1 |
| Other Nondurable Goods | 4.1 | 4.0 | -0.1 | -2.4 |
| Total Nondurable Goods | 46.1 | 42.7 | -3.4 | -7.4 |
| Total Manufacturing | 120.9 | 108.5 | -12.4 | -10.3 |
| Contract Construction | 19.0 | 21.8 | 2.8 | 14.7 |
| Transportation, Communications, and Utilities | 22.7 | 25.7 | 3.0 | 13.2 |
| Wholesale and Retail Trade | 81.5 | 100.7 | 19.2 | 23.6 |
| Finance, Insurance, and Real Estate | 19.3 | 23.0 | 3.7 | 19.2 |
| Services | 59.2 | 75.4 | 16.2 | 27.4 |
| Government | 48.1 | 57.3 | 9.2 | 19.1 |
| Other Manufacturing | 1.1 | 1.4 | 0.3 | 27.3 |
| Total Nonmanufacturing | 251.0 | 305.4 | 54.4 | 21.7 |
| Total Nonagricultural | 371.9 | 413.8 | 41.9 | 11.3 |

Note: Items may not add to totals due to rounding.

SOURCE: Kentucky Department for Human Resources.

TABLE 5

PERCENTAGE CHANGES IN EMPLOYMENT DURING CYCLICAL ECONOMIC DOWNTURNS, LOUISVILLE SMSA AND UNITED STATES

| | Total | | Manufacturing | | Construction | | Service Producing* | |
|---|---|---|---|---|---|---|---|---|
| Period | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. | Louisville | U.S. |
| 1969-70 | 0.5% | 0.7% | - 3.6% | -4.0% | - 7.6% | 0.4% | 3.8% | 2.8% |
| 1970-71 | -1.4 | 0.5 | - 7.8 | -3.8 | - 1.3 | 3.2 | 2.3 | 2.1 |
| 1974-75 | -4.8 | -1.7 | -12.9 | -8.7 | -12.2 | -12.3 | 0.1 | 1.6 |

*Service producing industries include (1) transportation, communication, and utilities, (2) wholesale and retail trade, (3) finance, insurance, and real estate, (4) services, (5) government, and (6) other manufacturing.

SOURCE: Kentucky Department for Human Resources and U.S. Department of Labor.

TABLE 6

COMPARISON OF UNEMPLOYMENT RATES, LOUISVILLE SMSA AND UNITED STATES

| Year | United States | Louisville |
|---|---|---|
| 1969 | 3.5% | 2.8% |
| 1970 | 4.9 | 4.1 |
| 1971 | 5.9 | 5.7 |
| 1972 | 5.6 | 4.4 |
| 1973 | 4.9 | 3.3 |
| 1974 | 5.6 | 4.2 |
| 1975 | 8.5 | 7.6 |
| 1976 | 7.7 | 6.4 |
| 1977 | 7.0 | 5.3 |
| 1978 | 6.0 | 5.2 |
| 1979* | 5.8 | 5.4 |

*Average of monthly data through September 1979.

SOURCE: Kentucky Department for Human Resources and U.S. Department of Labor.

been an absolute decline in manufacturing employment where employment gains since 1975 have not offset the losses suffered during the last recession.

## Population

The city of Louisville has been experiencing a decline in population since 1960 (Table 7). In fact, Jefferson County, which includes Louisville, has also faced a reduction in population since 1975. The flight to the suburbs is, in part, the result of school busing and tax differentials. Overall, for the Louisville SMSA, population growth has remained positive but has slowed during the past decade; the highest population growth rates are expected to occur in Bullitt and Oldham Counties in Kentucky and Clark County in Indiana.

Confirming the population move out of both Louisville and Jefferson County is the change in location of residential building permits (Table 8). Residential building permits in Jefferson County as a percent of total permits in the Louisville SMSA has been declining throughout the past decade.

## Local Taxes

Analysis of tax growth supports the fact that the city of Louisville is slipping, in some cases absolutely, but in all cases relative to Jefferson County outside of Louisville. It should be noted that the large jump in property tax levies by Jefferson County in 1975 resulted from the merger of the city of Louisville School Board into the Jefferson County School Board on July 1, 1975. Jefferson County was solely responsible for collecting public school taxes thereafter.

Of main consideration, as shown in Tables 9 and 10, growth in commercial and industrial real property tax levies in Louisville slowed sharply in the last part of the decade. In fact, there was an absolute decline in industrial tax levies. Alternatively, growth in residential

TABLE 7

POPULATION ESTIMATES AND PROJECTIONS, LOUISVILLE SMSA

| | | Kentucky Counties | | | Indiana Counties | | Total |
|---|---|---|---|---|---|---|---|
| Year | Louisville | Jefferson | Bullitt | Oldham | Clark | Floyd | SMSA |
| 1960 | 390,600 | 610,900 | 15,726 | 13,388 | 62,800 | 51,400 | 725,100 |
| 1970 | 361,472 | 695,055 | 26,090 | 14,687 | 75,876 | 55,622 | 826,553 |
| 1975 | 330,011 | 696,300 | 33,300 | 17,500 | 83,100 | 56,700 | 886,900 |
| 1978 | 322,870* | 678,200 | 39,100 | 23,600 | 87,900 | 58,500 | 887,300 |
| 1980 | N.A. | 670,369 | 42,560 | 29,121 | 90,000 | 58,300 | 890,350 |
| 1990 | N.A. | 719,241 | 53,497 | 36,666 | 104,300 | 59,300 | 973,004 |
| | | | ANNUAL GROWTH RATES | | | | |
| 1960-70 | -0.8% | 1.3% | 5.2% | 0.9% | 1.9% | 0.8% | 1.3% |
| 1970-80 | -1.6* | -0.4 | 5.0 | 7.1 | 1.7 | 0.5 | 0.8 |
| 1980-90 | N.A. | 0.7 | 2.3 | 2.3 | 1.5 | 0.2 | 0.9 |

*The most recent estimate of Louisville's population is for 1977.

N.A. means not available.

SOURCE: Louisville and Kentucky county figures are from University of Louisville Urban Studies Center. Indiana county figures are from Indiana State Board of Health.

TABLE 8

RESIDENTIAL BUILDING PERMITS, JEFFERSON COUNTY AND LOUISVILLE SMSA

| Year | Total SMSA | Jefferson County Amount | Jefferson County Percent of SMSA |
|---|---|---|---|
| 1970 | 9,680 | 7,735 | 79.9% |
| 1971 | 15,360 | 10,997 | 71.6 |
| 1972 | 13,905 | 11,169 | 80.3 |
| 1973 | 7,707 | 4,983 | 64.6 |
| 1974 | 4,669 | 2,859 | 61.2 |
| 1975 | 4,251 | 2,495 | 58.7 |
| 1976 | 4,690 | 2,486 | 53.0 |
| 1977 | 6,057 | 2,952 | 48.7 |
| 1978 | 5,677 | 3,503 | 61.7 |
| 1979* | 2,941 | 1,501 | 51.0 |

*Through August 1979.

SOURCE: Kentuckiana Regional Planning and Development Agency (KIPDA).

property taxes levied by the county picked up slightly since 1975, reflecting the sharp increase in housing values and higher assessments. Table 11 reveals that growth in personal property tax levies by the county was fairly steady. Supporting these data are the city tax levies for both real and personal property (Table 12). Combining city and county levies for personal and real property in Louisville, total levies in 1970 were $33,716,353 and in 1979 were $48,682,142, yielding an annual growth rate of only 4.2 percent. County levies for personal and real property outside of Louisville were $23,577,976 in 1970 and $59,142,053 in 1979, increasing at an annual yield of 10.8 percent. Confirming the population and business exodus from Louisville, growth in taxes heavily favor the area outside the city limits. During this same period, prices as measured by the Consumer Price Index increased approximately 6.9 percent per year, greater than the tax levy growth on property in Louisville but less than that for Jefferson County outside of Louisville.

TABLE 9

JEFFERSON COUNTY REAL PROPERTY TAX LEVY

| Year | Louisville Residential | Louisville Commercial | Louisville Industrial | Louisville Total* | Jefferson County Outside of Louisville Residential | Jefferson County Outside of Louisville Commercial | Jefferson County Outside of Louisville Industrial | Jefferson County Outside of Louisville Total* |
|---|---|---|---|---|---|---|---|---|
| 1970 | $ 5,145,211 | $2,128,012 | $ 529,113 | $ 7,812,784 | $14,824,095 | $ 4,007,639 | $1,608,316 | $21,417,148 |
| 1974 | 6,380,433 | 3,320,211 | 597,641 | 10,298,285 | 23,310,984 | 8,195,932 | 2,006,794 | 34,387,108 |
| 1975 | 11,753,782 | 8,622,467 | 1,823,763 | 22,200,012 | 26,044,094 | 8,972,674 | 1,906,268 | 37,092,221 |
| 1979 | 14,899,941 | 9,118,990 | 1,686,304 | 25,710,235 | 38,130,668 | 11,196,924 | 2,217,056 | 51,755,579 |

*The total includes levies on farm and rural, nonfarm property.

Note: In 1975, Louisville and Jefferson County School Boards were merged. Jefferson County became the sole tax collector for all public schools in the county.

SOURCE: Jefferson County Sheriff's Office.

TABLE 10

ANNUAL GROWTH RATES OF JEFFERSON COUNTY REAL PROPERTY TAX LEVY

| Period | Louisville Residential | Louisville Commercial | Louisville Industrial | Louisville Total* | Jefferson County Outside of Louisville Residential | Jefferson County Outside of Louisville Commercial | Jefferson County Outside of Louisville Industrial | Jefferson County Outside of Louisville Total* |
|---|---|---|---|---|---|---|---|---|
| 1970-74 | 5.5% | 11.8% | 3.1% | 7.1% | 12.0% | 19.6% | 5.7% | 12.6% |
| 1975-79 | 6.1 | 1.4 | -1.9 | 3.7 | 10.0 | 5.7 | 3.8 | 8.7 |

Note: Figures computed from data in Table 9.

TABLE 11

JEFFERSON COUNTY PERSONAL PROPERTY TAX LEVY

| Period | Louisville | Jefferson County Outside of Louisville |
|---|---|---|
| 1970 | $ 884,393 | $2,160,818 |
| 1974 | 1,315,315 | 3,754,990 |
| 1975 | 2,848,093 | 4,406,853 |
| 1979 | 4,197,006 | 7,386,474 |
| ANNUAL GROWTH RATES | | |
| 1970-74 | 10.4% | 14.8% |
| 1975-79 | 10.2 | 13.8 |

SOURCE: Jefferson County Sheriff's Office.

Another important source of tax revenue to the city and county is the occupational license tax. As shown in Tables 13 and 14, growth in these taxes on wages and profits earned in Louisville has been consistently less than growth in collections for wages and profits earned in Jefferson County outside of Louisville. However, in this case, the disparity in growth rates is not as great as was noted for property tax levies. Total city occupational license tax collections grew 8.1 percent annually from 1970 to 1979 while county collections outside the city increased 12.1 percent per year.

Overall, the city of Louisville has benefited from the occupational license tax in that it has been supportive of revenue growth greater than inflation. Nevertheless, the disparity between growth rates in tax levies and collections in Louisville and Jefferson County or the entire SMSA would be expected to worsen unless a turnaround in population trends or business location occurs.

TABLE 12

CITY OF LOUISVILLE REAL AND PERSONAL PROPERTY TAX LEVY

| Year | Levy[1] |
|---|---|
| 1970 | $25,019,176 |
| 1971 | 26,235,971 |
| 1972 | 27,082,232 |
| 1973 | 27,957,201 |
| 1974 | 30,710,082 |
| 1975 | 31,808,443 |
| 1976[2] | 16,018,612 |
| 1977 | 17,015,159 |
| 1978 | 17,459,848 |
| 1979[3] | 18,774,901 |

[1] Adjusted levy as of June 30, 1979

[2] Effective July 1, 1975, the Louisville Board of Education was merged into the Jefferson County Board of Education, which assumed the tax collection responsibility. City of Louisville residents paid property taxes for public schools to both the City of Louisville and Jefferson County in 1975.

[3] Annual growth rates for the periods 1970-75 and 1976-79 were 4.9 percent and 5.4 percent, respectively. Significant reassessments were made to achieve the 1979 levy.

SOURCE: Office of City Property Tax Collections, City of Louisville.

## Local Economic Strategies

Government and business leaders have been aware of the local demographic and economic changes during the past decade. Even prior to 1972, local government and business leaders had joined forces to organize the Louisville Central Area, Inc. (LCA). The LCA's purpose was to develop and implement plans to rejuvenate the

TABLE 13

OCCUPATIONAL LICENSE TAX COLLECTIONS FOR LOUISVILLE AND JEFFERSON COUNTY

| | Louisville | | Jefferson County[1] | |
|---|---|---|---|---|
| Year | Net Business Profits | Wages Withheld | Net Business Profits | Wages Withheld |
| 1961 | $1,680,427 | $ 8,357,310 | $ 352,143 | $ 2,976,183 |
| 1970 | 3,295,119 | 15,160,284 | 1,504,688 | 7,445,526 |
| 1975 | 4,251,297 | 22,733,208 | 2,508,479 | 12,292,789 |
| 1978 | 5,180,573 | 28,828,673 | 3,512,383 | 19,516,113 |
| 1979[2] | 6,632,333 | 30,595,740 | 4,598,452 | 20,426,157 |

[1] Taxes on wages and profits earned in Jefferson County outside of Louisville.

[2] Estimates for 1979 are based on 12/10 of amount collected through October 1979.

SOURCE: Sinking Fund, City of Louisville.

TABLE 14

ANNUAL GROWTH RATES IN OCCUPATIONAL LICENSE TAX COLLECTIONS

| | Louisville | | Jefferson County | |
|---|---|---|---|---|
| Period | Net Business Profits | Wages Withheld | Net Business Profits | Wages Withheld |
| 1961-70 | 7.8% | 6.8% | 17.5% | 10.7% |
| 1970-79 | 8.0 | 8.1 | 13.2 | 11.9 |
| 1970-75 | 5.2 | 8.4 | 10.8 | 10.5 |
| 1975-79 | 11.8 | 7.7 | 16.4 | 13.5 |

Note: Figures computed from data in Table 13.

Central Business District. This development has continued since the late 1960s. In 1972, the Louisville Economic Development Council, Inc. published a report with the purpose to have various areas within the city of Louisville designated as Special Impact Areas.[1] These neighborhood and business districts surrounded and included the Central Business District. Common to these areas were deteriorating economic conditions and high unemployment. By having these areas designated as Special Impact Areas, federal funding would be used to encourage commercial and industrial development and improve training and employment placement.

In 1974, the city of Louisville hired a consultant to prepare a working plan for the public and private community to reconstruct or redevelop the older inner city neighborhoods–the Special Impact Areas–as designated by the Economic Development Administration of the U.S. Department of Commerce.[2] In the consultant's report, it was found that Louisville had no comprehensive plan or adequate information system to obtain and direct funds for overall effective utilization.[3] Furthermore, it was noted that the city had not organized the Office of Economic Development until 1974.

The study reported that a serious accelerating disinvestment cycle had already begun. Population and business movement to the suburbs had led to exhaustion of capital stock and a deterioration of economic, physical, and environmental life of the inner city. To rejuvenate the area, the study concluded, initiative rests with the public sector with a public-private joint effort to turn it around.[4] Strategies would include industrial conservation, industrial development, and commercial redevelopment. But successful achievement of the goal to generate jobs within the areas would require redeveloping of whole neighborhoods in conjunction with commercial redevelopment. In addition, the success of reestablishing the Central City as a shopping center requires redevelopment of a ring of community shopping centers within the city boundaries.[5]

Substantial action and planning by state and local government and business leaders has taken place since 1974. In a recent report by Louisville's Department of Economic Development, the specifics of a Master Action Plan (MAP) were described.[6] The Louisville Industrial Development Authority was created in November 1977 which to date has approved nearly $30 million of industrial revenue bonds to retain or attract industry in Louisville. Furthermore, the means by which commercial and industrial redevelopment has been and will be conducted is explained. From this plan, announcement was made that thirty-three projects totaling $653 million have a good chance of starting within the next three years.[7] The agreement signed by U.S. officials allows the projects funded by state and local government and private monies to be potential recipients of federal funds through a coordinated, efficient mechanism.

Included in the $653 million of planned projects are $98.7 million for Station Industrial Park, $17 million for the Phoenix Hill Neighborhood redevelopment, $6.5 million for Oak Street (commercial) revitalization and $5.5 million for Russull Neighborhood redevelopment. Of the remainder of the $653 million, the projects are primarily located in the Central Business District, including, in part, the Galleria, the Kentucky Center for the Arts, renovation of the Seelbach Hotel, and Riverfront Square.

In summary, the beginning of the 1970s showed "patchwork" plans for rejuvenation of the city of Louisville. Through concerted efforts of state and local government and the Louisville business community, however, significant steps have been taken to revitalize the Louisville economy in a coordinated framework.

## Louisville's Economy in Perspective

The purpose of this section is to provide a frame of reference regarding local economic developments during the past decade. To be sure, policy prescription must be carefully based not only upon desired goals but upon

consideration of conditions and events that may also generate unexpected or undesired results. To better assess the Louisville economy, consideration of what is happening locally and nationally as well is important. The current demise or prosperity of the nation's thirty largest cities is analyzed by R. D. Norton in his recent book, *City Life Cycles and American Urban Policy*.[8] Clearly, he has characterized these cities as old, young, or anomalous.

"Old" or "industrialized" cities are depicted by Norton as those having certain characteristics. They (1) have or recently have had no room for geographical expansion, (2) are losing manufacturing employment and population, (3) have high city government expenditures per capita that probably include budgets for public schools, colleges, and welfare, (4) have declining or significantly lower income per capita than outlying areas, (5) have significant housing that was built before 1939, and (6) have high unemployment rates. Alternatively, those cities classified as "young," have had recent geographical expansion, growth in population and manufacturing employment, low population density, small per capita local budgets and taxes, and relatively low unemployment rates.

An anomalous city is classified as one with characteristics of both the young and old cities. In this context, Louisville may be classified as anomalous–entering old age or, at least, reaching middle age.

## Policy Alternatives

Norton points out that urban policy may include several strategies for the older cities in America. First, adoption of the "reservation" strategy would retain the social use of the city as a place for a permanent urban underclass and accept the diminishing economic use of the city. Second, a strategy of "rejuvenation" accepts the city as a reservation for the poor but attempts to revitalize the economic use of the city. In this case, the upper-middle and higher classes, it is assumed, are not attracted back as residents in the city. Third, the alternative of "dispersal" attempts to counter the use of the city as a reservation for the poor by attempting to disperse residents to growing economic areas but accepts that the city has diminishing economic use.[9]

At issue is whether or not the combination of public and private investment will effectively be able to retain residents or attract residents back to the inner city. Second, central city redevelopment cannot be successfully achieved without commercial (retail) redevelopment in the surrounding ring about the central city. Third, commercial/industrial redevelopment is a necessary but not a sufficient condition for rejuvenation. A successful redevelopment strategy must include significant residential rejuvenation in conjuntion with the commercial redevelopment. An incomplete program would generate the long-term result of a "dazzling downtown" surrounded by a ring of urban poor.

To date, Louisville's urban strategy has focused on rejuvenation. Consideration has been given to commercial and residential redevelopment outside of the central city, but so far remains minor given the planned funding under the Master Action Plan.[10]

In addition, apparently little or no consideration is being given to the "dispersal" strategy that would move people to jobs rather than jobs to people. To date, however, no city classified as "old" by Norton, has successfully reversed the population and manufacturing employment exodus.

## Louisville: Limited Expansion Potential

The opportunity for economic growth for Louisville as a city is in large part constrained by the city boundaries. Within the city limits, the availability of land for new industrial growth is significantly limited. There is one large major site within the city under the Master Plan–Station Industrial Park, which totals approximately 100 acres. At this time, however, the land cost is significantly greater than costs of property located in the Bluegrass Industrial Park in Jefferson County or the Jefferson Industrial Park in New Albany, Indiana.[11]

According to the Comprehensive Plan of the Louisville-Jefferson County Planning Commission, most space available for industrial and residential growth lies in the eastern and southeastern part of Jefferson County. Certainly most growth in recent years has been in these areas. Furthermore, the northern boundary of the city is the Ohio River.

One of the key factors, if not the key factor, to the old/young city classification has been the ability to expand geographically.[12] The fiscal decline that results in the older cities is accentuated by the loss of both business and high income residents. The ability of the city to expand geographically as decentralization occurs allows the city to remain fiscally healthy as expansion occurs.

The ability of Louisville to expand via annexation is limited in that the city is essentially surrounded by 4th, 5th, and 6th class cities that have no desire to become a part of Louisville. A case in point is the recent unsuccessful attempt by the city to annex the area to which the main branch of the Louisville Post Office moved.

Alternatively, one option that remains possible is the annexation of unincorporated land in Jefferson County where most residential and business expansion is expected to occur in the next decade.[13]

Another solution to the problem of fiscal disparity might be through reorganization of local government.[14]

Discussion of reorganization, consolidation, or development of a metro government is not new, however.[15] The economic benefits could range from improving the equity of tax sharing to completely eliminating fiscal disparity.[16]

## Summary and Conclusions

The decade of the 1970s has resulted in a loss of population in both the city of Louisville and Jefferson County and a slowdown in population growth for the entire five-county SMSA. Furthermore, there has been an absolute decline in manufacturing employment for the entire SMSA, suggesting a new age has been entered in the long-term economic cycle of the Louisville-area economy. In addition, the loss in employment and population in the city of Louisville has led to erosion in the property tax base. Collections of Louisville's profit and wage occupational license taxes, however, have been extremely helpful in minimizing the disparity in growth between city and county tax revenues.

Reaction by state and local government officials and business leaders has been significant in confronting the trends that have developed in the past decade. Set forth in the Master Action Plan, investment in Louisville, initiated by both public and private spending, focuses on the Central Business District to date. Furthermore, efforts to improve coordination between Louisville and Jefferson County are taking place to offset the city-county fiscal disparity.

The major challenges for the 1980s regarding economic development in the Louisville area may be considered in three parts. First, improvement in economic growth for the entire SMSA will be of major importance. Attraction of new business as well as retention of current business will be essential to the economic health of the entire area. Second, offsetting the trend of fiscal disparity between the city of Louisville and the rest of the SMSA, but especially Jefferson County, is necessary not only for the financial well-being of the city of Louisville, but the economic climate, real and perceived, of the entire area. Third, the rejuvenation of the Central Business District will be dependent upon not only investment in the Central Area but investment in the commercial and residential neighborhoods surrounding the Central Business District itself.

Investments to rejuvenate a city must be a part of a carefully prescribed program arranged by local, state, and federal government in tandem with the business community. Specification of precise goals and desired results are necessary in light of past and current trends and developments. In particular, as manufacturing employment and population become more decentralized, the economic and social functions of the city may well change. Investment, in certain cases, therefore, may be more effective by aiding the inner-city resident to obtain employment where employment opportunities occur rather than attempting to bring employment to the inner-city resident.[17]

The attitudes, plans, and actions of both the business and government leaders that have developed in the 1970s provide a strong base and are essential to meet the challenges of the 1980s.

### Footnotes

[1] See *Target '80, Overall Economic Development Program for Louisville, Kentucky*, Louisville Economic Development Council, September 1972.

[2] See *Strategies and Policies for Economic Redevelopment, Special Impact Area, Louisville, Kentucky*, prepared for the City of Louisville Economic Development Office by Nathan-Barnes and Associates, December 1974.

[3] Ibid., p. 5.

[4] Ibid., pp. 85-93.

[5] Ibid., pp. 93-97 and 144-147.

[6] *Overall Economic Development Program, City of Louisville, Kentucky, Annual Report and Program Projection, Fiscal Year 1978-1979*, Department of Economic Development, City of Louisville, June 1979.

[7] "Pact with U.S. To Bolster 33 Projects in Louisville," *Courier-Journal*, October 10, 1979, p. A1.

[8] R. D. Norton, *City Life-Cycles and American Urban Policy* (New York: Academic Press, Inc.), 1979.

[9] Ibid., p. 11.

[10] See "Pact with U.S. To Bolster 33 Projects in Louisville," p. A1. Of the $653 million in projects planned $29 million are for specific outlying commercial and residential redevelopment.

[11] Louisville Department of Economic Development.

[12] Norton, Chapter 4.

[13] See "An Aldermanic Agenda . . . 1. Seige Initiative on Annexation," Editoral, *The Louisville Times*, November 6, 1979, p. A6.

[14] See "Local Panel Backs Method for Changing Government," *The Courier Journal*, November 9, 1979, p. A1, and "County May Move on Two Fronts on Reorganization," *The Courier-Journal*, November 10, 1979, p. B1.

[15] For a discussion why consolidation should be considered, see Joel H. Goldstein, "The Political Economy of Urban Consolidation: Jefferson County," *Executive Scene*, Vol. 4, No. 1, Summer 1975, pp. 9-13.

[16] See William H. Oakland, "Central Cities: Fiscal Plight and Urban Prospects for Reform," in *Current Issues in Urban Economics*, edited by M. Mieszlowski and M. Straszheim (Baltimore: The Johns Hopkins University Press), 1979, pp. 322-358. Oakland summarizes other remedies which include emphasizing a local income tax, user charges, metropolitizing specific city functions, state assumption of certain local functions, and financial assistance for state and federal government. Each of the above, to a certain degree, has already taken place regarding Louisville and Jefferson County. Oakland concludes that this whole problem points to intergovernmental grants designed to compensate local governments for the money they lose on the high-cost, low-revenue components of their population.

[17] For further discussion on this point see Norton, Chapter 9, and Roy Bahl, Bernard Jump, Jr., and Larry Schroeder, "The Outlook for City Fiscal Performance in Declining Regions," in *The Fiscal Outlook for Cities, Implications of a National Urban Policy*, edited by Roy Bahl (Syracuse: Syracuse University Press), 1978, pp. 1-47.

# VI. Agriculture in Kentucky—Situation, Recent Trends, and Projected Development

by D. Milton Shuffett*

The increased need for U.S. farm products in both domestic and international markets over the past decade has led to substantial growth in Kentucky's agricultural output and to changes in the mix of commodities produced. The growing world population and increases in world trade assure the United States of an expanding international market for farm products and the resources in Kentucky agriculture provide the potential for large increases in agricultural production in the state during the 1980s.

A study by the College of Agriculture, University of Kentucky, in 1977 indicated that Kentucky farmers use their land resources at less than full capacity. Potential row crop land is used for pasture and row crop rotations are longer on some land than is necessary under good conservation practices. Kentucky agricultural income could be increased by about 65 percent from 1975 to 1985 and the potential exists to increase income by 160 percent with present technology by full and proper use of the resources in agriculture. Progress toward the potentials that exist has already been made and future progress depends upon such factors as costs versus returns for particular commodities, profit opportunities in alternative enterprises and domestic and foreign demand for agricultural products. It also depends upon expansion in the agribusiness sector to provide production supplies and market outlets which enable Kentucky to compete for markets with producers from other areas of the U.S. and with producers in other countries of the world.

## Recent Developments In Kentucky Agriculture

For most agricultural products, Kentucky produces a relatively small portion of the total U.S. output; prices at which Kentucky producers sell commodities are determined mainly by supply-demand conditions at the U.S. or world level. Wheat, soybeans, and corn prices, for example, are not greatly influenced by Kentucky's total production. Kentucky produces 0.5 percent of the nation's wheat crop, 2.3 percent of the soybeans, and about 1.8 percent of the total corn crop. While prices in Kentucky may vary from the U.S. average due to temporary surpluses or deficits, the overall level of prices for these crops is determined primarily by supply and demand factors outside the state.

This report attempts to analyze recent trends, the present situation, and the outlook for major farm products produced by Kentucky farmers. It identifies some of the problems that must be faced if agriculture in the state is to achieve its potential in growth and income.

The structure of Kentucky agriculture has followed the national trends toward fewer and larger farms. In 1977 the state has 123,000 farms that averaged 124 acres per unit. However, the U.S. Census of Agriculture reported that in 1974 over 45 percent of Kentucky farms were larger than 100 acres and 17 percent were 220 acres or larger. Kentucky has a large number of small farms where the operator is a part-time or retired farmer, or the unit is primarily a residential farm. A growing number of larger and highly commercialized-highly capitalized units are becoming increasingly productive. Recent trends indicate that farm numbers will continue to decline and the reduction in numbers will be mainly for the smaller commercial farms. Most part-time and residential farms will remain but output from these units make up only a small part of total agricultural production for the state. Combination of many of the small commercial farms into larger and more economical units is essential if operators are to be able to make the capital investments required in today's agriculture.

## Trends, Situation, and Outlook for Major Farm Commodities

### Corn

Corn production in Kentucky increased from 72 to 132 million bushels between 1965 and 1979 (see Table 1). The increased output resulted mainly from yield increasing technology in varieties of corn, fertilization and land management practices, weed and insect control, and improved management practices in production.

*The author is Professor and Vice Chairman, Department of Agricultural Economics, University of Kentucky.

TABLE 1

PRODUCTION OF FARM PRODUCTS, KENTUCKY, 1960-1979

| Year | Corn (million bushels) | Soybeans (million bushels) | Wheat (million bushels) | Burley Tobacco (million pounds) | Milk (million pounds) | Cattle and Calves[1] (thousands) | Hogs[2] (thousands) |
|---|---|---|---|---|---|---|---|
| 1960 | 73.4 | 4.4 | 4.8 | 320 | 2,460 | 2,053 | 2,144 |
| 1965 | 72.4 | 7.1 | 5.4 | 395 | 2,633 | 2,470 | 1,910 |
| 1970 | 49.4 | 15.1 | 6.1 | 383 | 2,455 | 2,803 | 2,600 |
| 1975 | 87.8 | 32.4 | 12.0 | 439 | 2,319 | 3,750 | 1,475 |
| 1976 | 138.7 | 28.4 | 10.2 | 461 | 2,383 | 3,450 | 1,695 |
| 1977 | 132.3 | 40.9 | 10.1 | 415 | 2,426 | 3,300 | 1,764 |
| 1978 | 119.9 | 42.3 | 6.8 | 428 | 2,222 | 3,120 | 1,778 |
| 1979[3] | 132.1 | 51.2 | 11.3 | 344 | 2,244 | 2,600 | 2,223 |

[1] January 1 inventory.
[2] Pig crop.
[3] Preliminary.

SOURCE: USDA Statistical Reports.

Acreage planted to corn increased from 1,049 thousand acres in 1965 to 1,279 thousand acres in 1970 (an increase of 21.9 percent) while average yield per acre increased from 69 to 104 bushels during the same period–an increase of over 50 percent.

During the past 15 years corn acreage has shifted from the eastern and central areas of the state to the more western areas of the state where land is more suitable for the production of corn in larger production units. During the last few years acreage has substantially increased in central areas of Kentucky as farmers have shifted some of the land into those crops which give the greatest returns.

The increased production of corn in the state and the tendency for more of the crop to be produced by larger and more commercialized farmers has resulted in distinct shifts in the marketing pattern. In the mid-1960s less than 30 percent of the corn produced in Kentucky was sold; most was produced for use as livestock feed on the farm where it was grown. Currently about 60 percent of a much larger corn crop is sold as cash grain and large increases in marketing facilities have been necessary to handle the increased volume of corn and other grains.

During the past decade Kentucky has shifted from a corn deficit to a corn surplus producing state. Exports from Kentucky are greater than the net surplus production, however, since it is more economical for deficits in some areas of central and eastern Kentucky to be imported from other states. Corn exported from Kentucky tends to move to the South to livestock feeding areas and to ports for export in foreign trade.

Kentucky has the land resources to increase corn acreage to over 2.0 million acres during the decade of the 1980s and to increase production by more than 90 million bushels. The location and the availability of river transportation provides access to the growing international market in feed grains. To fully capitalize on the growing market for corn and to meet potentials for production will require widespread use of available production technology and the development of new and expanded market facilities which provide for efficient handling of grain. This will enable Kentucky producers to compete with other producing areas for the increased quantities that will be needed in domestic and world markets.

## Soybeans

Soybeans have been the most rapidly growing cash crop produced by Kentucky farmers. Acreage increased from 295 thousand in 1965 to more than 1,650 thousand acres in 1979. Production of soybeans in Kentucky in 1979 is expected to be 51.2 million bushels.

Soybeans produced in Kentucky are sold to buyers in Kentucky and the South for processing into meal and oil, but they also go to the export market largely through the port of New Orleans. Based on trends in production and land resources suitable for soybeans in Kentucky, it is expected that acreage of soybeans will increase to over 2.1 million during the decade of the 1980s and production will reach 85 million bushels.

Historically soybean production has been concentrated in western Kentucky, but in recent years substantial production increases have occurred in central Kentucky. As in the case of corn and other grains, expanded market and transportation facilities will be required to efficiently handle the increased output of soybeans. Otherwise, the potential that exists for Kentucky

farmers and Kentucky agribusiness to profit from a growing world market will not be fully realized.

## Wheat and Other Small Grains

The production of wheat, barley, rye, oats, and grain sorghum is not an important farm activity in Kentucky agriculture. Production of these grains in 1975 amounted to about 15 million bushels. The use of Kentucky's land in its best and most productive uses would lead to production of small grains on approximately 600 thousand acres and result in production of over 40 million bushels of these grains by the end of the 1980s. As double-cropping of land becomes more feasible and widespread through the improvement of technology, the output of small grains from Kentucky agriculture will increase and add substantially to Kentucky's agricultural income.

## Burley Tobacco

Burley tobacco is the most important agricultural cash crop in the state. Income from burley tobacco amounts to about $550 million per year. Kentucky farmers have the land, climate, and managerial expertise to produce the finest quality burley tobacco in the world.

Burley's chief use is in the manufacture of blended cigarettes and domestic manufacturers use about 500 million pounds of burley each year in their products. The domestic use of burley has been slightly declining over recent years. Total cigarette use in the U.S is relatively stable with increased population about offsetting declining consumption per capita. However, the use of burley in cigarette manufacturing has declined due to manufacturing efficiencies, fuller use of the tobacco leaf, to a larger proportion of cigarettes being filter tipped, and to an increased proportion of foreign tobacco being used in cigarette blends. The domestic market for burley tobacco remains uncertain over the next decade. The emphasis on tobacco and health relationships, increased taxation of tobacco products, and regulations on smoking in public facilities are factors that tend to reduce cigarette consumption. Population growth and rising income levels will be offsetting factors but domestic use of burley will likely continue to decline slowly over the next decade. The decline could be accelerated if manufacturers continue to increase the amounts of imported burley in their products.

In contrast to the relatively stable total consumption of cigarettes in the U.S., the use of the blended cigarette is increasing rapidly in the world. The American type blended cigarette requires burley tobacco and exports of U.S. burley have expanded from about 55 million pounds in 1970 to about 125 million pounds per year currently. The world demand for burley tobacco will continue to expand. The extent to which Kentucky will share in this market depends upon a number of factors. Production of burley outside the U.S. has expanded rapidly over the last 15 years and now exceeds production in the United States. Most foreign grown burley is low quality but cheaper than U.S. burley. To continue to increase exports for an expanding market, Kentucky and U.S. producers will need to retain their superiority in quality.

Burley tobacco will continue to be vital to the agricultural economy of Kentucky over the decade of the 1980s and stability rather than growth is anticipated. The long run future of burley production may depend not only on consumer demands for tobacco products in this country and in the world, but on the ability to develop mechanization for production, harvesting, and marketing. Burley is a labor intensive crop requiring over 300 hours of labor per acre. With rising wage rates and scarcity of seasonal agricultural laborers, producers are finding the crop more and more difficult to produce and costs of production are increasing rapidly. Development of economical mechanization for burley would not only enable farmers to produce but could lead to lower costs of production and greater price competitiveness with foreign sources in both domestic and foreign markets.

## Beef Cattle

Kentucky's soil and climate are suitable for excellent forage production and as a result beef cattle are highly important to the agriculture of the state. Cash receipts from farm marketings of cattle and calves amounted to $576 million in 1978. Cattle and calves on farms increased from 2.47 million in 1965 to 3.75 million in 1975. Although numbers have declined since the mid-1970s due to depressed prices, cattle inventories are again increasing in Kentucky. The low intensity with which Kentucky agricultural land has been used in the past provides the basis for tremendous growth in the beef cattle industry. Increased production of row crops (corn and soybeans) can be accomplished and still leave the land resources suitable for hay and pasture production to provide for expansion in forage consuming livestock.

Traditionally the beef industry in Kentucky has been a beef cow-feeder calf industry. Most of the calf crop has been sold as feeders with the calves exported to feedlots in states to the north and west. In recent years some movement has occurred by farmers toward overwintering feeder calves for sale the following year as yearlings. This has enabled producers to sell heavier feeders and realize additional income from their beef enterprise. Some cattle are fed to slaughter weights by Kentucky

feeders, but feeding cattle to slaughter weights has not developed into a major part of the state's beef industry.

Growth in the beef industry in the 1980s will likely be in both size and output mix. If farmers take full advantage of the resources available that are suited for beef production, marketings of feeder calves by the late 1980s would increase by 550 to 600 thousand head per year compared to the mid-1970s. Yearling sales could increase by 200 thousand head and finished cattle by 50 to 60 thousand head. To take advantage of the potentials that exist for beef cattle, production will require the implementation of programs for (1) improving forage production, (2) controlling disease and insect problems in herds, (3) breeding for better calf crops, (4) managing the beef system for economical production, and (5) marketing the product so as to make the beef enterprise a profitable part of the farm business.

## Hogs

The annual pig crop in Kentucky varies with the production cycle in hogs, but ranges from 1.5 to 2.0 million in most years. Hogs, like cattle, are marketed as both feeders and finished animals. In many areas of the state where grain production is not sufficient for livestock feed needs, most hogs are sold as feeder pigs. Many of the feeder pigs produced in central and eastern Kentucky are purchased by out-of-state buyers for finishing in feedlots in the Corn Belt. However, increased grain production in Kentucky has resulted in more hogs being fed to slaughter weights.

Annual income from hogs in Kentucky amounts to more than $125 million in most years ($150 million in 1978) depending on prices received by farmers and production. Commercial feeders who operate large scale confined feeding operations are becoming more common in the state and year-to-year variation in the output of slaughter hogs is less than previously. The establishment of large scale feeding operations requires heavy capital investment and success depends upon an increased level of management skills for handling disease problems and achieving efficiency in feed conversion, financing, and marketing.

The increased within-state production of feed grains and the supply of feeder pigs available should provide the basis for increased importance of the hog industry in Kentucky.

## Dairy

Kentucky has always had a sizable dairy industry; presently farm income from the sale of dairy products amounts to about $225 million per year. The dairy industry in Kentucky has followed the national pattern with fewer dairy farms but farm dairy herds are larger and more productive. In the past the industry has been made up of groups of larger producers who produce for the fluid milk market and another group of smaller producers who produce milk to be used for manufacturing dairy products. Health regulations and economic incentives have hastened the trend toward more milk being produced for the fluid market with declining numbers of producers and amounts of milk exclusively for manufacturing purposes. It is expected that this trend will accelerate; by the end of the 1980s most Kentucky dairymen will produce for the fluid market with remaining quantities diverted into processing for cheese, butter, etc. The dairy industry in the state will likely remain about stable to slightly increasing in total milk production but the output will be produced on fewer farms with larger and more productive herds per farm. The changes anticipated will require very high capital investments in land, facilities, and animals and improved breeding, feeding, and management will be essential for the units to be profitable businesses.

## Summary

Agriculture is a highly important industry in Kentucky in terms of capital investment, an employer of people, and in terms of income. Cash receipts from farm marketings in 1978 amounted to $2,040 million. The potential exists to more than double this income during the next decade if opportunities are realized. Markets for agricultural products are becoming more worldwide in character and exports of U.S. farm products will increase to meet the needs of a growing world population. Kentucky's location relative to transportation routes and the commodities produced in Kentucky provides a unique opportunity to expand output to meet the increased market needs.

The products of Kentucky agriculture that likely will be most affected by markets and for which there are the greatest potentials for increased production are corn and soybeans, and beef cattle and hogs. Corn production could be expanded by 80 to 100 million bushels in the next 10 years and soybean output could be increased by about 50 million bushels.

The state has tremendous potential for expanding beef cattle numbers and for increasing the weights at which beef animals are sold. Beef cattle marketings could increase by 700 to 800 thousand head per year if Kentucky farmers use their resources efficiently.

Increased feed grain production in the state offers the opportunity for expansion in hog production, particularly for finishing the hogs that are now sold as feeder pigs to be fed out in other areas of the country.

Other agricultural enterprises have excellent prospects for expansion in the years ahead, particularly some of

the small grains, horticultural products, nursery and greenhouse products. While these crops contribute importantly to agricultural income, they are not as widely produced by farmers as are the major field crops and livestock enterprises.

The dairy and tobacco producing industries in the state provide a large proportion of the state's cash farm income. Demands for these products and the structure of the industry in the case of dairy products point to relative stability in dairy and tobacco production and income in the future.

If agricultural growth in Kentucky proceeds according to trends and potentials, a number of problems will need to be overcome. Major problems will include:

1. *Financing.* Both long term and operating capital requirements for an efficient farm business are becoming extremely high. Acquiring and using capital are increasingly important considerations in operating a farm business.
2. *Development, adoption and use of technology.* Leading producers are quick to take advantage of modern and new technology to increase output and efficiency of production. In order to increase Kentucky's agricultural productivity to its potential, broader acceptance and use of technology will be required. Farmers will need to be informed and taught how to use present and developing technology. An urgently needed development in technology is mechanization in tobacco production, harvesting, and marketing. Labor requirements in this crop are making it more and more difficult for Kentucky producers to compete with foreign producers on a price basis.
3. *Market development and promotion.* World markets exist for many Kentucky agricultural products. Market information systems and local market facilities will be required to provide economical access by Kentucky producers to the national and world markets.
4. *Transportation.* A large part of the costs of marketing involve transportation costs. Assembly of products into economically efficient volumes and movement to markets by the most efficient modes of transportation become increasingly important as energy costs raise transportation costs. If Kentucky producers are to compete with producers in other areas, transportation becomes highly important.
5. *Processing.* Prices of many Kentucky products are discounted because processing plants are not available nearby. Kentucky tends to ship unfinished products (tobacco, feeder cattle, feeder pigs, etc.) for finishing or processing elsewhere. In those cases where sufficient volumes exist for economical processing, farm prices could be improved by local processing and distribution of finished products.
6. *Taxation.* Inflated values of farmland and the associated high property taxes on land make it difficult for farmers to earn returns in agriculture comparable to investments in nonagricultural areas. Kentucky's agricultural value assessment of land for tax purposes is important in enabling farmers to be competitive. Likewise, it is important that inheritance taxes be such that farms can be maintained in production over successive generations in order to provide the influx of young farmers into Kentucky agriculture.

# VII. Coal in Kentucky—Situation, Recent Trends, and Projected Development

by Arthur F. Nicholson*

There are many possible viewpoints of the Kentucky coal industry and what it means to Kentucky:

- A source of employment to about 55,000 Kentuckians who work in the mines and ten of thousands of others who provide support services to the industry.
- A challenge to the several hundred owners and operators to mine the coal, sell it in the highly competitive markets, transport it over costly and, at times, inadequate transportation networks, pay the ever escalating costs of materials, labor and taxes, and earn a profit for their efforts.
- A source of about $175 million in severance tax revenues and about $100 million in sales, corporate and personal income, and property taxes.
- A source of about 6.5 percent of the personal income earned by all Kentuckians.
- A large resource of energy for industrial and consumer fuel users and a source of chemical feedstocks for industrial development in Kentucky.
- A destroyer of local roads and a burden on the rail system.
- An industry constrained by governmental regulation, inadequate transportation, manpower and personnel problems, and high costs for labor, materials and services.

There are many other viewpoints of the industry. However, only one or two points can be analyzed adequately in this short paper. Intriguing and worthwhile topics such as the real and possibly unnecessary hardships caused by some features of the Clean Air Act and the Surface Mine Act, the impact of Kentucky's severance tax and sales tax on the marketability of Kentucky coal, and the coming crisis in coke capacity must be dealt with elsewhere.

The essential thrust of this paper is market oriented in the belief that if sufficient markets exist the producers will find a way to serve the market. Not that the other constraints are not important, but if the markets do not exist there is little reason to be concerned over the other problems. Since the prospects for the Kentucky coal industry are highly related to the U.S. economic outlook and the national coal industry, the paper starts with a look at forecasts of the national coal industry and some of the factors affecting the markets for Kentucky coal and ends with a forecast of Kentucky coal production through 1987.

*The author is an Energy Consultant to the Institute of Mining and Minerals Research, University of Kentucky.

## National Outlook

Conditions in the national economy, the nation's energy policies, and the national coal industry are major factors in the environment in which the Kentucky coal industry functions. The outlook for the U.S. economy is covered adequately elsewhere and is beyond the scope of this article. However, it is appropriate to examine some pertinent aspects of national energy policy and the outlook for the national coal industry.

It is well known that the three U.S. presidents since the Arab oil embargo in 1973 have stressed increased production of coal. Goals to double 1973 coal production to over a million tons per year by 1985 were established in the energy plans of all three administrations. As shown in Table 1, coal production in 1973 was 592 million tons. Coal production would have had to grow at an annual compounded growth rate of about 5.0 percent if the goal of 1.1 to 1.2 billion tons was to be met by 1985. The growth in production from 1973 through 1978 has been at a rate of about 2.1 percent. If the national goal is to be achieved, the average growth rate from 1978 to 1985 would have to be about 9.1 percent per year. No serious energy analyst would expect that growth rate to be achieved, since the constraints that have limited coal production still exist.

The data in Table 2 show a coal forecast presented by the ICF Corporation. The forecast is based on a 5.0 percent growth rate, since ICF has been working with the Federal Energy Administration and the U.S. Department of Energy since 1973 and the ICF analysis provided the basis for the national coal policy. The forecast in Table 3 was prepared by Joel Price, a coal analyst for Dean Witter Reynolds, Inc. Even though they looked at the same constraints and there is considerable interaction between the two agencies, Price's forecast for 1985 is about 13 percent higher than the ICF forecast. This spread between two of the most respected analysts

TABLE 1

COAL CONSUMPTION AND PRODUCTION IN U.S. FOR SELECTED YEARS
(Millions of Tons)

| Year | Utilities | Coke Plants | Other Domestic | Import | Total Consumption | Export | Inventory Change | Production |
|---|---|---|---|---|---|---|---|---|
| 1973 | 387 | 94 | 75 | - | 556 | 33 | -17 | 592 |
| 1974 | 390 | 90 | 73 | 2 | 553 | 60 | - 8 | 603 |
| 1975 | 403 | 83 | 70 | 1 | 556 | 66 | +27 | 648 |
| 1976 | 447 | 84 | 68 | 1 | 559 | 59 | +22 | 679 |
| 1977 | 475 | 77 | 68 | 1 | 620 | 54 | +16 | 689 |
| 1978 | 480 | 71 | 67 | 3 | 618 | 40 | -11 | 654 |
| 1979[1] | 541 | 78 | 71 | - | 690 | 60 | + 4 | 754 |
| 1980[2] | 577 | 80 | 73 | - | 730 | 63 | -13 | 780 |

[1] Preliminary data. Components may not add to totals.
[2] National Coal Association forecast.

SOURCE: "Statistics and Trends of Energy Supply, Demand, and Prices," *Annual Report to Congress*, U.S. Department of Energy and National Coal Association.

of the coal industry highlights the problems and uncertainties which the coal industry faces.

Both the above forecasts include an increase of metallurgical coal consumption of over 10 percent by 1985. However, as can be seen in Table 4, the coke capacity in the U.S. is projected to decrease by 5.3 million tons by 1985. Therefore, the metallurgical coal market is more likely to decrease than increase.

Industrial and retail coal demand is extremely difficult to forecast. The ICF forecast is based upon a growth rate of about 6.0 percent per year between 1978 and 1985. The Price forecast of 104 million tons in 1985 was about 15.6 percent higher than ICF's forecast for the market. The Powerplant and Industrial Fuel Use Act of 1978 was designed to force the conversion of industrial plants to coal. However, coal-fired boilers cost about four times the cost of oil-fired boilers, and the many potential exemptions in the Act indicate that conversion to coal will be slow.

The forecasts agree on the export level and are not far apart on the demand level by the electric utilities. Since the utility market is by far the largest, factors affecting that market have the greatest impact on the demand for coal. The Dean Witter forecast is based upon a growth rate of electrical demand of about 6.3 percent per year while the ICF forecast is a growth rate of about 5.5 percent. A significant point is that Dean Witter forecasts a 13.3 percent growth rate for utilities located west of the Mississippi River and a growth rate of only 2.7 percent for utilities located east of the Mississippi River. A further significant point is that *Electrical World*, in the September 5, 1979 issue, forecast the

TABLE 2

FORECAST PRODUCTION OF COAL 1978-95
(Millions of Tons)

| | 1978 | 1985 | 1990 | 1995 | Compound Annual Growth Rate (%) |
|---|---|---|---|---|---|
| Appalachia | 359 | 365 | 400 | 450 | 1 |
| Midwest | 124 | 175 | 250 | 325 | 6 |
| North Great Plains | 99 | 250 | 355 | 490 | 10 |
| Rest of West | 72 | 150 | 200 | 250 | 8 |
| Total U.S. | 654 | 940 | 1,205 | 1,515 | 5 |

SOURCE: ICF Incorporated. Presented at a coal and nuclear seminar, Richmond, Virginia, October 29-30, 1979.

TABLE 3

THEORETICAL NATIONAL AGGREGATES FOR SUPPLY AND DEMAND
(Millions of Tons)

| Demand | 1978 | 1980[1] | 1985[1] |
|---|---|---|---|
| Utilities[2] | 480.6 | 554.0 | 737.0 |
| Metallurgical | 71.1 | 78.0 | 84.0 |
| Industrial and Retail | 67.7 | 71.0 | 104.0 |
| Export | 39.8 | 53.0 | 70.0 |
| Synthetics | - | - | 5.0 |
| Total | 659.2 | 756.0 | 1,000.0 |
| Production | 653.9 | 842.4 | 1,059.9 |

[1] Projected.
[2] Includes imports but excludes anthracite of 1.0 million tons.

SOURCE: Joel Price, *The Coal Observer*, Dean Witter Reynolds, Inc., October 1979, p. 18.

TABLE 4

U.S. OVEN-COKE CAPACITY IN EXISTENCE: CURRENT AND PROJECTED THROUGH 1985
(Annual Capacities in Net Tons)

| Dec. 31 | Number of Batteries | Number of Ovens | Capacity in Existence[1] |
|---|---|---|---|
| Current[2] | 199 | 11,413 | 63,377,505 |
| 1979 | 194 | 11,024 | 61,235,320 |
| 1980 | 193 | 10,990 | 61,096,985 |
| 1981 | 186 | 10,704 | 60,680,520 |
| 1982 | 174 | 10,045 | 58,573,375 |
| 1983 | 170 | 9,794 | 59,985,460 |
| 1984 | 166 | 9,590 | 58,211,660 |
| 1985 | 165 | 9,545 | 58,056,535 |

[1] Potential maximum annual capacity of oven-coke batteries *in existence*, whether active or out of operation for repair, rebuilding, or other purposes; capacity *in operation* is generally 5 percent to 10 percent lower than that in existence and represents a more meaningful measure of productive capability. Projected changes in capacity are based on current individual company plans to install new oven-coke batteries and to repair, rebuild, modify, and abandon existing batteries; they do not account for the impact on capacity to be exerted by increasing facility age and continuing wear and tear over the period considered.

[2] July 31, 1979.

SOURCE: William T. Hogan and Frank T. Koelble, *Analysis of the U.S. Metallurgical Coke Industry*, Fordham University, October 1979 (mimeo).

growth rate for electrical energy to average about 4.0 percent between 1978 and 1985.

In summary, national energy policies have been based upon an annual growth of coal production of about 5.0 percent, but the growth rate in consumption from 1973 through 1978 has been about 2.1 percent. Two of the most prominent and influential coal analysts are forecasting that the production targets of about a million tons of coal by 1985 will be met. However, both clearly overstate the amount of metallurgical coal that can be used, and both use a much higher growth rate for electricity than the forecast of *Electrical World*. From the Kentucky perspective, however, the significant point is the low rate of growth for coal consumption by utilities east of the Mississippi.

## Kentucky Coal Industry Outlook

Of prime interest to Kentucky is how the Kentucky coal industry will function within the national environment outlined above. As noted in Table 5, the growth in Kentucky's coal production has been even slower than the national rate. The annual growth rate from 1973 through 1978 has been about 1.4 percent. However, production in western Kentucky declined from 53.6 million tons in 1973 to 39.8 millions tons in 1978 while production in eastern Kentucky increased from 73.9 million tons in 1973 to 97.0 million tons in 1978. In order to appraise the future of Kentucky coal, it is useful to have some understanding of the factors that have been involved in the industry's slow growth since 1973.

One easy way to identify the major problems plaguing the industry is to note the series of events immediately following the Arab oil embargo in November 1973. There was almost immediate interest by coal users in increasing coal stockpiles, which caused prices to double and triple within a few weeks. Several things happened. There was a rush to get into the coal "business," and coal properties and coal equipment prices went up dramatically. However, there was no new equipment in inventory, and delivery dates soon became quite long as the backlog increased. Some old equipment was taken out of junkpiles and repaired and a few new mines were opened, but essentially there as no way to significantly increase coal production immediately. Prices continued to go up, and more people were attracted to the industry. The higher spot prices of $35 to $40 per ton created great pressure on coal producers who had contracts at $8 to $10 per ton. Some contract coal found its way to the spot market which created several additional problems. Since contract coal was not being delivered, the utility buyers increased their efforts to buy coal on the spot market, and the new spot shippers put a burden on the railroads to provide more cars to more and different shipping points to move this highly profitable coal. The result was an apparent transportation crisis caused by a shortage of coal cars and by an increase in number and size of coal trucks on the inadequate roads. By late

TABLE 5

KENTUCKY COAL PRODUCTION
(Millions of Tons)

| Year | Eastern Kentucky | Western Kentucky | Total |
|---|---|---|---|
| 1973 | 73.9 | 53.6 | 127.5 |
| 1974 | 85.0 | 51.8 | 136.8 |
| 1975 | 88.2 | 56.0 | 144.2 |
| 1976 | 89.0 | 53.6 | 142.6 |
| 1977 | 95.9 | 51.7 | 147.6 |
| 1978 | 97.0 | 39.8 | 136.8 |
| 1979* | 98.0 | 42.0 | 140.0 |

*Kentucky Department of Energy preliminary estimate.

SOURCE: Kentucky Department of Mines and Minerals, *Annual Report*, various issues 1973-78; also can be obtained from the Kentucky Economic Information System.

1974 the utilities' stockpiling objectives had been largely achieved, and the coal "boom" was over.

Several important factors affecting the coal industry can be identified from the brief scenario above. First—and most important—is that the consumption of coal cannot be increased significantly overnight. Most past coal booms have been "stockpiling booms" that have lasted only a few months. The inevitable result of these stockpiling booms is overcapacity, because the operators try to hang on between booms to cash in on the next one. However, it is difficult to foresee when the next one will come; the United Mine Workers' ability to close down the industry appears to be decreasing, and stockpiles for electric utilities on July 31, 1979 were about 83 days of operating requirements. There can be little justification for larger stockpiles when interest rates are about 15 percent and no coal shortage is in sight. Also, the overcapacity in the industry indicates that it will be difficult for coal prices to rise much faster than the cost of production.

## Transportation

Transportation was an obvious problem in 1974 and has not been fully resolved since. The apparent problem seems to be a recurring shortage of coal cars and locomotives. There have been frequent and strong accusations that the railroads have not had sufficient cars to provide the desired level of service to all coal shippers. The problem is much more complex and may be insoluble in the short run. There can be little doubt that it is a real problem. A survey of the coal buyers for the major utilities in the marketing area in October and November documented several instances where sales by Kentucky coal producers were lost because of inability to deliver coal or by the high freight cost involved. However, the survey also revealed that the utilities in general were receiving more coal than they wanted to receive. Thus, it could be argued that the railroads were hauling all the coal that needed to be hauled. It would seem to follow that if additional cars were available the utilization of coal cars would decrease and the cost of hauling coal would increase.

It is much easier to discuss the transportation problem in terms of short haul and long haul. Long haul is usually by barge and by unit train. There have been fewer complaints on the level of service by these modes by Kentucky coal producers. However, the cost of rail movement to markets on the Gulf Coast has caused some utilities to import coal from South Africa, Poland or Australia. Also, there is growing interest in the construction of pipelines to move coal to utilities in Georgia and Florida. Construction of these pipelines to provide competition with the railroads appears to be in the best interest of the Kentucky coal industry. However, the slurry pipelines would not eliminate the most difficult coal transportation problem—the collection of coal in bulk shipment volumes.

The collection problem presents a difficult trade-off between more use of trucks, better collection by the railroads, or some innovative technology. The coal truck provides more flexibility than the other modes to serve the needs of the smaller operator but it is also the highest cost, and the small operator is already squeezed by other market forces. The truck also causes damage to the roads and creates other environmental problems. On the other hand, collection by rail cars is highly inefficient utilization of coal cars and locomotives. Conveyors, except for very short distances, appear to be too costly and too inflexible. Thus, there is an excellent opportunity for new technology to resolve the coal collection problem. Smaller slurry pipelines to act as feeders to the trunk line may be a solution, but they may also be too costly and too inflexible to serve other than certain specific locations. It is easier to speculate on what will not work than what will. However, continued progress in the development of unit train loading points would appear desirable from all viewpoints. The more steady and growing demand for coal should also enable the railroads to improve service to areas where production volume can be sustained. There seems to be no way to avoid the use of trucks in some areas and the importance of the truck operator to coal production in eastern Kentucky must be recognized.

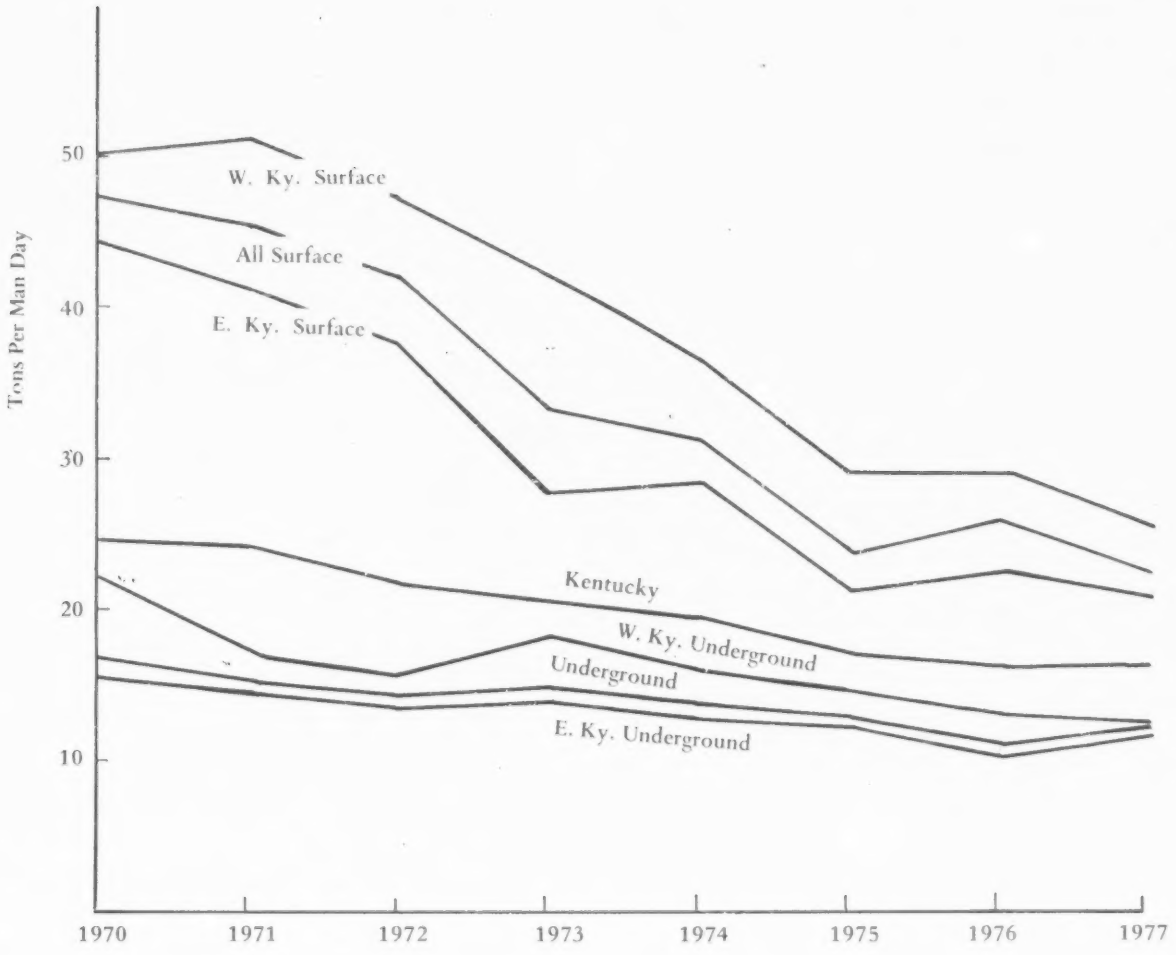
## Manpower and Productivity

The lack of quality manpower to mine the coal was considered to be a significant problem in 1974. Upon examination, the problem was not so much a shortage of people who wanted to work in the mines as it was a shortage of personnel with the required educational and technical skills. Programs were established at the University of Kentucky in mining engineering and programs in mining technology at the University of Kentucky Community Colleges and at Pikeville College. In addition, training in basic equipment operation and maintenance was established at vocational training centers in the coal fields. These training programs and improved management by the mining companies have greatly reduced the problem caused by shortages of personnel to work in the mines.

However, the continued decline in production per employee is a serious problem for many coal operators. As shown in Figure 1, the declining trend appears to have leveled off in 1977. However, preliminary data from later periods indicate the leveling off may have been favorably influenced by the strong market in 1977. The soft markets in 1978 and 1979 appear to have caused the decline to continue.

FIGURE 1

KENTUCKY COAL PRODUCTION IN TONS PER MAN-DAY, 1970-77




SOURCE: Kentucky Department of Energy (unpublished).

At the same time that the production per man-day is declining, the wage rates are increasing. An indication of the effect of the increased wages can be observed from the data in Tables 6 and 7. Table 6 shows the dollar cost per hour impact of the 1978 UMW-BCOA agreement. Nonunion labor rates can be expected to roughly parallel these increases. Table 7 shows the increased labor cost per ton by type of mine for the years 1978-80 based on 1977 productivity data. If productivity in these years is lower than in 1977 (as it likely will be), the higher wage rates will result in even greater unit costs. Since labor rate increases are inevitable, the only way to slow the increase in cost of coal production is to improve productivity.

Unfortunately, the Surface Mining Control and Reclamation Act of 1977 is expected to further reduce the productivity of surface mining and force more and more coal operations underground. The trend in recent years has been towards a higher percentage of the total from surface mines. For example, about 53 percent of Kentucky production in 1974 was from surface mines, but 57 percent of the total was from surface mines in 1977.

It is doubtful that even the harsh provisions of the

TABLE 6

1978 UMW–BCOA AGREEMENT EFFECT ON LABOR RATES
(Dollars Per Hour)

| | 1978 | 1979 | 1980 |
|---|---|---|---|
| Payroll Costs | | | |
| Wages | $1.80 | $2.20 | $2.60 |
| Cost of Living Adjustment | 0.00 | 0.30 | 0.60 |
| Roll-Up | 0.55 | 0.67 | 0.80 |
| | 2.35 | 3.17 | 4.00 |
| Pensions and Benefits | 1.10 | 1.34 | 1.46 |
| Miscellaneous | 0.29 | 0.32 | 0.34 |
| Total | $3.74 | $4.83 | $5.80 |

SOURCE: Kentucky Department of Energy (unpublished).

implementing regulations of the 1977 Act can reverse this trend because of the increased cost of underground mining. The weak coal market will make it extremely difficult to pass on the higher mining costs. Therefore, unless some relief can be found for the more severe constraints (i.e., water quality provisions, returning to the original contour, mining on steep slopes, etc.) or the productivity in underground mines can be improved, the cost of mining coal in Kentucky will increase significantly. The impact of this increase will be further compounded by rapidly increasing costs of transportation. The result could be more foreign coal in coastal markets and more western U.S. coal in the upper midwestern markets.

## Jobs and Income

Coal mining in Kentucky provides direct employment for about 55,000 Kentuckians who earn an average of about $20,000 per year. Thus, income from coal mining is about 6.7 percent of all personal income in Kentucky.

TABLE 7

ESTIMATED ADDITIONAL COST PER TON UNDER THE NEW CONTRACT BY TYPE OF MINE IN KENTUCKY
(Based on 1977 Productivity Data)

| Type of Mine | Productivity Tons/Man-Day | Cost Per Ton 1978 | 1979 | 1980 |
|---|---|---|---|---|
| **Western Kentucky** | | | | |
| Strip/Truck | 23.16 | 1.17 | 1.51 | 1.82 |
| Strip/Rail | 26.19 | 1.04 | 1.34 | 1.61 |
| Strip/Water | 36.46 | 0.74 | 0.96 | 1.15 |
| Auger/Strip/Truck | 25.66 | 1.06 | 1.36 | 1.64 |
| **Total Surface** | 25.34 | 1.07 | 1.38 | 1.66 |
| Underground | 12.47 | 2.40 | 3.10 | 3.72 |
| **Total Western Kentucky** | 17.43 | 1.63 | 2.10 | 2.52 |
| **Eastern Kentucky** | | | | |
| Strip/Truck | 19.43 | 1.40 | 1.80 | 2.16 |
| Strip/Rail | 14.61 | 1.86 | 2.40 | 2.88 |
| Auger/Strip/Truck | 21.58 | 1.26 | 1.62 | 1.95 |
| Auger/Strip/Rail | 2.86 | 9.48 | 12.24 | 14.70 |
| Auger/Truck | 36.41 | 0.74 | 0.96 | 1.15 |
| Auger/Rail | 11.73 | 2.31 | 2.99 | 3.58 |
| **Total Surface** | 20.66 | 1.31 | 1.69 | 2.04 |
| Underground | 11.62 | 2.57 | 3.33 | 3.99 |
| **Total Eastern Kentucky** | 15.46 | 1.83 | 2.37 | 2.84 |
| All Underground | 11.93 | 2.51 | 3.24 | 3.89 |
| All Surface | 22.07 | 1.23 | 1.59 | 1.91 |
| All Kentucky | 16.07 | 1.76 | 2.28 | 2.73 |

SOURCE: Kentucky Department of Energy (unpublished).

The data in Tables 8 and 9 show employment in coal mining for the years 1973 through the first ten months of 1979 and the average weekly earnings. While these data are impressive, the data in Tables 10 and 11 present a more sobering picture. The data show that there has been significant unemployment in the coal industry during the past four years, the number of insured unemployment in coal mining averaged about 10 percent of total insured unemployment. Table 11 shows that except for 1977, when the coal industry was preparing for a strike, the unemployment rate for coal miners was higher than the total unemployment rate in Kentucky.

## Forecast of Kentucky's Coal Production

The most difficult but also the most useful task is to interpret the impact of the different factors affecting the demand for coal and develop a forecast of the potential market demand for Kentucky coal. The discussion in the National Outlook had heavy emphasis on the steam coal market because it is not only by far the largest market for Kentucky coal but also the only market with significant growth potential in the near term. In addition, it is the market with the most available information on future plans and prospects. The retail market and the export market are small and unlikely to grow significantly. Growth in the use of coal as an industrial fuel is dependent on planned new coal-fired power plants in the market area. However, plans for these new plants are generally not available as public information. The only other significant market is the coking coal market, which (as described above) cannot be a growth market with a declining coking capacity in the U.S.

There are several possible ways to compile the effects of the information available on the factors that could

TABLE 8

TOTAL EMPLOYMENT AND NUMBER OF PRODUCTION WORKERS IN KENTUCKY'S COAL MINING INDUSTRY, 1973-79

| | Annual Average Employment | | Average Total Employment | |
|---|---|---|---|---|
| Year | Total | Production Workers | High Month | Low Month |
| 1973 | 26,700 | 22,300 | 28,200 (Dec.) | 25,400 (Jan. and Feb.) |
| 1974 | 34,400 | 28,380 | 39,800 (Dec.) | 29,100 (Jan.) |
| 1975 | 41,500 | 33,697 | 42,800 (Jun.) | 39,400 (Feb.) |
| 1976 | 41,800 | 35,060 | 43,100 (Sept.) | 40,200 (Feb.) |
| 1977 | 43,500 | 33,252 | 50,700 (Nov.) | 31,300 (Dec. Strike) |
| 1978 | 47,900 | 36,519 | 56,000 (Dec.) | 28,500 (Feb. Strike) |
| 1979 | 54,200* | 45,229* | 55,500 (Jan.) | 52,400 (Mar.) |

*Ten-month average.

SOURCE: Kentucky Department for Human Resources; also can be obtained from the Kentucky Economic Information System.

TABLE 9

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS IN KENTUCKY'S COAL MINING INDUSTRY, 1973-79

| Year | Weekly Average Earnings | High Weekly Earnings | Low Weekly Earnings |
|---|---|---|---|
| 1973 | $254.56 | $274.55 (Dec.) | $243.31 (Feb.) |
| 1974 | 247.31 | 275.90 (Oct.) | 154.33 (Nov. Strike) |
| 1975 | 281.24 | 343.37 (Dec.) | 259.44 (Jun.) |
| 1976 | 335.12 | 382.28 (Feb.) | 298.94 (Jan.) |
| 1977 | 365.05 | 495.64 (Oct.) | 212.91 (Dec. Strike) |
| 1978 | 397.85 | 433.60 (Sept.) | 284.47 (Jan. Strike) |
| 1979 | | 504.89 (Jun.) | 356.83 (Jul. Vacation) |

SOURCE: Kentucky Department for Human Resources, also can be obtained from the Kentucky Economic Information System.

TABLE 10

INSURED UNEMPLOYMENT IN ALL COVERED INDUSTRIES AND BITUMINOUS COAL MINING,* 1976–October 1979

| | Insured Unemployment | | | | Insured Unemployment | | |
|---|---|---|---|---|---|---|---|
| | Total | Coal Mining | Percent of Total | | Total | Coal Mining | Percent of Total |
| 1976 | | | | 1978 | | | |
| Average | 34,740 | 2,378 | 6.0 | Average | 31,518 | 3,144 | 10.0 |
| January | 48,487 | 2,893 | 7.9 | January | 39,766 | 5,261 | 13.2 |
| February | 46,899 | 3,708 | 7.9 | February | 62,373 | 6,760 | 10.8 |
| March | 43,545 | 3,212 | 7.4 | March | 47,822 | 4,292 | 9.0 |
| April | 35,292 | 2,887 | 8.2 | April | 31,505 | 2,023 | 6.4 |
| May | 29,362 | 2,251 | 7.7 | May | 22,649 | 1,155 | 5.1 |
| June | 28,159 | 1,717 | 6.1 | June | 22,099 | 1,676 | 7.6 |
| July | 32,361 | 1,854 | 5.7 | July | 26,301 | 1,287 | 4.9 |
| August | 32,275 | 2,061 | 6.4 | August | 27,661 | 3,071 | 11.1 |
| September | 26,528 | 1,640 | 6.2 | September | 23,445 | 4,680 | 20.0 |
| October | 27,085 | 2,137 | 7.9 | October | 22,708 | 3,552 | 15.6 |
| November | 28,758 | 1,999 | 7.0 | November | 19,606 | 1,605 | 8.2 |
| December | 38,142 | 2,181 | 5.7 | December | 32,285 | 2,361 | 7.3 |
| 1977 | | | | 1979 | | | |
| Average | 32,146 | 1,768 | 5.5 | Average | 38,965 | 3,867 | 9.9 |
| January | 52,811 | 2,411 | 4.6 | January | 58,578 | 4,335 | 7.4 |
| February | 54,366 | 3,647 | 6.7 | February | 54,063 | 5,745 | 10.6 |
| March | 41,370 | 2,170 | 5.2 | March | 49,494 | 6,002 | 12.1 |
| April | 32,575 | 2,390 | 7.3 | April | 38,752 | 4,194 | 10.8 |
| May | 26,356 | 1,760 | 6.7 | May | 30,929 | 3,512 | 11.4 |
| June | 23,978 | 1,092 | 4.6 | June | 28,920 | 3,562 | 12.3 |
| July | 25,657 | 1,205 | 4.7 | July | 34,314 | 3,721 | 10.8 |
| August | 33,033 | 1,849 | 5.6 | August | 35,199 | 2,930 | 8.3 |
| September | 22,192 | 1,125 | 5.1 | September | 29,579 | 2,569 | 8.7 |
| October | 22,583 | † | | October | 29,824 | 2,104 | 7.1 |
| November | 20,399 | † | | | | | |
| December | 30,490 | 1,832 | 6.0 | | | | |

*Total insured unemployment represents weeks claimed during week including the 19th of the month. Coal mining unemployment is based on 20 percent sample of weeks claimed during the period.

†Less than 5 percent of total.

SOURCE: Bureau of Manpower Services, Kentucky Department for Human Resources (unpublished).

impact future coal production. There is no known "best" or accurate method. The procedure used in developing this forecast is to calculate the potential demand for Kentucky coal by the electric utilities and to assign values to the other market areas. The underlying assumption is that the market demand will equate to production over the long term. Aberrations such as stockpiling for a strike, the impact of a strike, transportation problems, or poor planning by the coal industry could cause production to surge in one year and lag in the next. These periods of production at a rate greater than coal can be consumed are clear evidence that the industry is market-limited and further indicates that coal prices will lag general price rises, except for brief periods of temporary surges in demand for coal.

## Market Distribution Area

About 98 percent of eastern Kentucky steam coal and about 99 percent of western Kentucky steam coal is sold in the East North Central, the East South Central and the South Atlantic Regions of the U.S. The area roughly corresponds to the upper midwest and southeast portions of the United States. The steam coal markets in each of the states in these three areas in 1977 is examined in considerable detail in Tables 12, 13, and 14.

It can be readily observed in Table 12 that western U.S. coal is a strong competitor in the East North

TABLE 11

UNEMPLOYMENT RATE FOR ALL EMPLOYMENT AND FOR COAL MINING IN KENTUCKY, 1976-79

| Year | All Employment | Coal Mining |
|---|---|---|
| 1976 | 5.6 | 5.7 |
| 1977 | 4.6 | 4.1 |
| 1978 | 5.3 | 6.6 |
| 1979* | 5.9 | 7.1 |

*Rate through October is 5.6 percent, but estimated rate for year is about 5.9 percent.

SOURCE: Kentucky Department of Energy (unpublished).

Central Region. Sales in the region in 1977 for the four western states–Colorado, Montana, Utah, and Wyoming–totaled 25,827,000 tons, while sales of Kentucky coal in the region were 24,688,000 tons. The quality of the western U.S. coal was good (sulfur and ash content was low) and, except for Ohio and Indiana, the price of the western coals was quite competitive.

Kentucky provided about 64 percent of the coal used by electric utilities in the East South Central Region in 1977 (see Table 13). Alabama was the next largest supplier with only 19 percent. Western U.S. coal was insignificant with less than 1 percent. Both Australia and South Africa also provided small amounts of coal to the region in 1977.

Kentucky provided 43 percent of the coal used in the South Atlantic Region by electric utilities in 1977 (see Table 14). West Virginia was the next largest supplier with about 27 percent. About 1.1 percent of the steam coal was supplied by Poland and South Africa. No western U.S. coal was consumed by electric utilities in the region in 1977. It should be noted that the Poland and South African coals were competitively priced in Florida with Kentucky coals.

The data in Tables 12, 13 and 14 are descriptive of the market conditions for existing coal-fired electric generating plants in 1977. Except for abnormal aberrations that might disturb the relative equilibrium, the market shares for the existing plants might hold–at least for the near term. Future market prospects then would seem to depend on new coal-fired generating capacity added to the regions.

## Planned Electric Power Plant Changes

The data in Table 15 show the electric generating capacity changes planned for three of the Regional Electric Reliability Councils–ECAR, MAIN, and SERC–in the U.S. which roughly corresponds to the above described market regions. The data on the planned capacity changes is collected by the Regional Electric Reliability Councils and reported to the U.S. Department of Energy and is probably the most up-to-date and reliable data on projected capacity changes. As can be noted, coal and nuclear are the two prime fuels for base-load plants. However, some No. 6 oil-fired capacity is planned through 1981. Pumped hydro is the major source of power for new peak load plants, but there are some No. 2 oil plants planned for each year, and the total net capacity additions for the ten years is 3,586 megawatts. Since the plants planned for No. 2 oil are largely combustion turbine plants, alternate fuels such as natural or synthetic gas, methanol, or some other synthetic fuel may be substituted in later years.

The Southeastern Electric Reliability Council roughly corresponds to the East South Central and the South Atlantic market regions except for Kentucky, West Virginia and part of Virginia (see Map 1). These two areas are the faster growing markets for Kentucky coal and are the least likely to be served by western U.S. coal because of transportation costs. However, as can be observed from Table 16, coal-fired plants represented only about one-third of the total net capacity additions. Also, about 22 percent of the new coal-fired capacity is planned for 1987, the last year of the ten-year planning cycle. With the usual slippage that occurs in the planning cycle much of this coal-fired capacity could slide back into the next decade.

The data in Table 17 show the electric generating capacity changes planned for ECAR and MAIN which roughly includes the East North Central market region and, in addition, includes Kentucky, West Virginia and part of Virginia. About 58 percent of the planned new capacity is coal-fired, and only 34 percent is nuclear powered. As noted from Map 1, this market is situated around the Great Lakes, Ohio River and the Mississippi River, which facilitates the movement of western U.S. coal to these markets.

In summary, in the Southeast market area, which is somewhat insulated from the competition from western U.S. coal, nuclear power is a very strong competitor to Kentucky coal. In the upper Midwest area, western coal with access to cheap water transportation is a strong competitor to Kentucky coal.

## Forecast Methodology

Kentucky's potential share of the coal demand by the new electric utility plants in the market areas is calculated in Tables 18, 19 and 20. In all three tables the new plant capacity was converted into megawatt hours of output on the basis of an operating rate of 50 percent, which may be conservative for new base-load

TABLE 12

SELECTED DATA ON COAL DELIVERED TO ELECTRIC UTILITIES EAST NORTH CENTRAL AREA IN 1977

| Origin | Quantity 1,000 Tons | Mean Btu/Lb | Mean Ash Percent | Mean Sulfur Percent | $/Ton | Mean Delivered Price $/MM Btu All Dest. | $/MM Btu to Ohio | $/MM Btu to Mich. | $/MM Btu to Ind. | $/MM Btu to Ill. | $/MM Btu to Wisc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| W. Virginia | 10,303 | 12,128 | 13.6 | 2.15 | 25.24 | 1.04 | 0.89 | 0.98 | 1.08 | 1.37 | 1.43 |
| E. Kentucky | 13,955 | 11,784 | 12.5 | 1.23 | 28.40 | 1.20 | 1.16 | 1.24 | 0.98 | 1.40 | 1.43 |
| W. Kentucky | 10,733 | 10,996 | 14.0 | 3.59 | 20.47 | 0.93 | 0.80 | 0.97 | 0.78 | 1.11 | 1.06 |
| Wyoming | 10,577 | 9,037 | 8.3 | 0.50 | 15.42 | 0.85 | 1.20 | – | 1.26 | 1.29 | 0.80 |
| Montana | 12,629 | 8,957 | 7.6 | 0.64 | 14.73 | 0.82 | – | 0.97 | 1.10 | 1.16 | 0.75 |
| Utah | 939 | 11,569 | 11.9 | 0.63 | 24.34 | 1.05 | 1.75 | – | 1.37 | – | – |
| Colorado | 1,682 | 10,914 | 9.4 | 0.50 | 19.28 | 0.88 | 1.56 | – | 1.62 | 1.55 | – |
| Illinois | 26,440 | 10,628 | 11.8 | 2.97 | 19.17 | 0.90 | – | 1.15 | 0.94 | 0.86 | 1.02 |
| Indiana | 20,522 | 10,804 | 11.2 | 2.89 | 15.46 | 0.72 | 0.82 | 1.05 | 0.70 | 1.04 | 0.97 |
| Ohio | 38,398 | 11,041 | 15.8 | 3.45 | 22.01 | 1.00 | 0.97 | 1.13 | 0.82 | – | 0.97 |
| Alabama | 2 | 11,910 | 12.4 | 0.78 | 31.89 | 1.00 | – | – | – | 1.00 | – |
| Tennessee | 38 | 10,802 | 17.4 | 2.41 | 27.91 | 1.29 | – | – | 0.83 | 1.48 | – |
| Pennsylvania | 3,669 | 12,046 | 13.1 | 3.10 | 25.94 | 1.08 | 0.99 | 1.16 | 1.05 | – | 1.16 |
| Virginia | 119 | 11,824 | 13.5 | 1.81 | 29.98 | 1.27 | 1.26 | 1.30 | 1.21 | – | – |
| Maryland | 60 | 11,962 | 14.6 | 1.89 | 28.94 | 1.21 | 1.07 | 1.36 | – | – | – |
| Oklahoma | 3 | 11,456 | 13.2 | 4.46 | 35.10 | 1.53 | – | – | – | – | 1.53 |
| Total | 150,069 | 10,834 | 12.2 | 2.50 | 21.23 | 0.98 | 1.01 | 1.10 | 0.81 | 1.02 | 0.97 |

SOURCE: Federal Energy Regulatory Commission, *Annual Summary of Cost and Quality of Electric Utility Plant Fuels*, 1977.

TABLE 13

SELECTED DATA ON COAL DELIVERED TO ELECTRIC UTILITIES EAST SOUTH CENTRAL AREA IN 1977

| Origin | Quantity 1,000 Tons | Mean Btu/Lb | Mean Ash Percent | Mean Sulfur Percent | $/Ton | Mean Delivered Price $/MM Btu All Dest. | $/MM Btu to Ala. | $/MM Btu to Ky. | $/MM Btu to Miss. | $/MM Btu to Tenn. |
|---|---|---|---|---|---|---|---|---|---|---|
| Ohio | 962 | 11,045 | 15.7 | 3.42 | 21.35 | 1.00 | 0.89 | 0.92 | – | 1.01 |
| E. Kentucky | 12,979 | 11,479 | 13.8 | 1.52 | 24.05 | 1.05 | 1.24 | 1.05 | 1.26 | 0.96 |
| W. Kentucky | 29,693 | 10,853 | 15.4 | 3.82 | 19.53 | 0.90 | 1.12 | 0.74 | 1.15 | 1.03 |
| Tennessee | 4,703 | 11,599 | 15.8 | 2.47 | 25.63 | 1.10 | 1.34 | 1.24 | – | 1.09 |
| Alabama | 12,793 | 11,696 | 14.3 | 1.39 | 26.35 | 1.13 | 1.12 | – | 1.21 | – |
| Illinois | 1,896 | 10,819 | 15.0 | 2.95 | 19.70 | 0.91 | – | 0.94 | 0.81 | 1.08 |
| Indiana | 2,374 | 11,021 | 10.1 | 2.92 | 18.27 | 0.83 | – | 0.76 | – | 1.08 |
| W. Virginia | 35 | 11,581 | 18.5 | 1.44 | 25.25 | 1.09 | – | 1.09 | – | – |
| Virginia | 452 | 11,648 | 14.5 | 1.73 | 23.78 | 1.02 | – | – | – | 1.02 |
| Wyoming | 126 | 8,150 | 6.3 | 0.30 | 21.92 | 1.34 | 1.43 | 1.38 | – | 1.22 |
| South Africa | 60 | 11,513 | 13.6 | 0.67 | 27.61 | 1.20 | – | – | 1.20 | – |
| Australia | 118 | 11,363 | 13.6 | 0.64 | 32.09 | 1.41 | – | – | 1.41 | – |
| Total | 66,213 | 11,203 | 14.6 | 2.71 | 22.22 | 0.99 | 1.13 | 0.85 | 1.09 | 1.03 |

SOURCE: Federal Energy Regulatory Commission, *Annual Summary of Cost and Quality of Electric Utility Plant Fuels*, 1977.

TABLE 14

SELECTED DATA ON COAL DELIVERED TO ELECTRIC UTILITIES IN SOUTH ATLANTIC REGION IN 1977

| Origin | Quantity 1,000 Tons | Btu/Lb | Mean Ash Percent | Mean Sulfur Percent | $/Ton | Mean Delivered Price $/MM Btu All Dest. | $/MM Btu to Fla. | $/MM Btu to Ga. | $/MM Btu to Md. | $/MM Btu to N.C. | $/MM Btu to S.C. | $/MM Btu to Va. | $/MM Btu to W. Va. | $/MM Btu to Del. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E. Kentucky | 33,582 | 11,927 | 12.1 | 1.23 | 29.81 | 1.25 | 1.50 | 1.15 | – | 1.28 | 1.24 | 1.41 | 1.31 | – |
| W. Kentucky | 7,206 | 11,390 | 10.1 | 2.83 | 25.68 | 1.13 | 1.27 | 0.99 | – | – | – | – | – | – |
| Pennsylvania | 4,137 | 12,082 | 13.7 | 1.72 | 26.13 | 1.08 | – | – | 1.09 | – | – | 1.79 | 0.87 | 1.09 |
| W. Virginia | 25,822 | 11,842 | 14.9 | 1.92 | 24.88 | 1.05 | – | – | 1.64 | 1.22 | 1.48 | 1.47 | 0.98 | – |
| Virginia | 12,265 | 11,953 | 14.2 | 1.07 | 29.42 | 1.23 | – | 1.21 | – | 1.20 | 1.24 | 1.29 | 1.29 | – |
| Alabama | 1,205 | 12,213 | 13.0 | 1.89 | 28.40 | 1.16 | 1.29 | 1.11 | – | – | 1.40 | – | – | – |
| Tennessee | 3,317 | 11,930 | 12.6 | 1.39 | 28.70 | 1.20 | – | 1.18 | – | 1.22 | 1.31 | 1.10 | 1.37 | – |
| Indiana | 1,304 | 10,895 | 9.6 | 1.12 | 17.66 | 0.81 | 1.38 | 0.79 | – | – | – | – | – | – |
| Illinois | 1,082 | 11,728 | 9.7 | 3.20 | 24.55 | 1.05 | 1.05 | – | – | – | – | – | – | – |
| Ohio | 1,080 | 10,723 | 18.7 | 2.65 | 19.11 | 0.89 | – | – | – | 1.49 | – | – | 0.89 | – |
| Maryland | 1,911 | 11,573 | 16.2 | 1.53 | 23.05 | 1.00 | – | – | 1.12 | – | – | 1.74 | 0.88 | – |
| Poland | 305 | 11,888 | 9.2 | 1.31 | 30.33 | 1.28 | 1.28 | – | – | – | – | – | – | – |
| South Africa | 746 | 11,663 | 14.0 | 0.74 | 29.92 | 1.28 | 1.28 | – | – | – | – | – | – | – |
| Total | 94,145 | 11,836 | 13.2 | 1.59 | 27.38 | 1.16 | 1.27 | 1.10 | 1.20 | 1.24 | 1.24 | 1.36 | 1.02 | 1.09 |

SOURCE. Federal Energy Regulatory Commission, *Annual Summary of Cost and Quality of Electric Utility Plant Fuels*, 1977.

TABLE 15

ELECTRIC GENERATING CAPACITY CHANGES PLANNED FOR ECAR, MAIN AND SERC, 1978-87
(Megawatts)

| Type of Fuel | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coal - New | 5,474 | 2,098 | 6,121 | 5,964 | 8,089 | 7,528 | 6,016 | 10,015 | 4,971 | 11,259 | 67,535 |
| Coal - Uprate | 201 | 74 | 51 | 140 | – | – | – | – | – | 53 | 519 |
| Coal - Derate | 27 | 64 | 8 | 86 | 13 | 71 | – | – | – | – | 269 |
| Coal - Retire | 662 | 34 | 58 | 108 | 78 | – | 328 | 529 | 57 | – | 1,854 |
| **Coal - Total** | **4,986** | **2,074** | **6,106** | **5,910** | **7,998** | **7,457** | **5,688** | **9,486** | **4,914** | **11,312** | **65,931** |
| Uranium - New | 2,801 | 4,271 | 8,566 | 5,883 | 8,174 | 6,759 | 8,430 | 6,102 | 3,433 | 5,442 | 59,861 |
| Uranium - Uprate | 548 | 36 | 66 | -705 | 475 | 740 | 65 | 31 | – | – | 1,256 |
| **Uranium - Total** | **3,349** | **4,307** | **8,632** | **5,178** | **8,649** | **7,499** | **8,495** | **6,133** | **3,433** | **5,442** | **61,117** |
| No. 6 Oil - New | 1,821 | 1,285 | 775 | 775 | – | – | – | – | – | – | 4,656 |
| No. 6 Oil - Uprate | 307 | – | – | -14 | -90 | -676 | -32 | -42 | -212 | -114 | -873 |
| **No. 6 Oil - Total** | **2,128** | **1,285** | **775** | **761** | **-90** | **-676** | **-32** | **-42** | **-212** | **-114** | **3,783** |
| No. 2 Oil - Net | 377 | 176 | 54 | 138 | 138 | 392 | 890 | 195 | 453 | -14 | 3,645 |
| Natural Gas | 20 | -35 | -21 | – | 6 | – | – | – | -29 | – | -59 |
| Waste Heat | 10 | – | – | – | – | -69 | – | – | – | – | -59 |
| Pumped Hydro | 1,540 | 240 | 443 | – | 2,885 | 384 | 155 | – | 250 | 500 | 6,397 |
| **Total** | **12,410** | **8,047** | **15,989** | **12,833** | **19,586** | **14,987** | **15,196** | **15,772** | **8,809** | **17,126** | **140,755** |

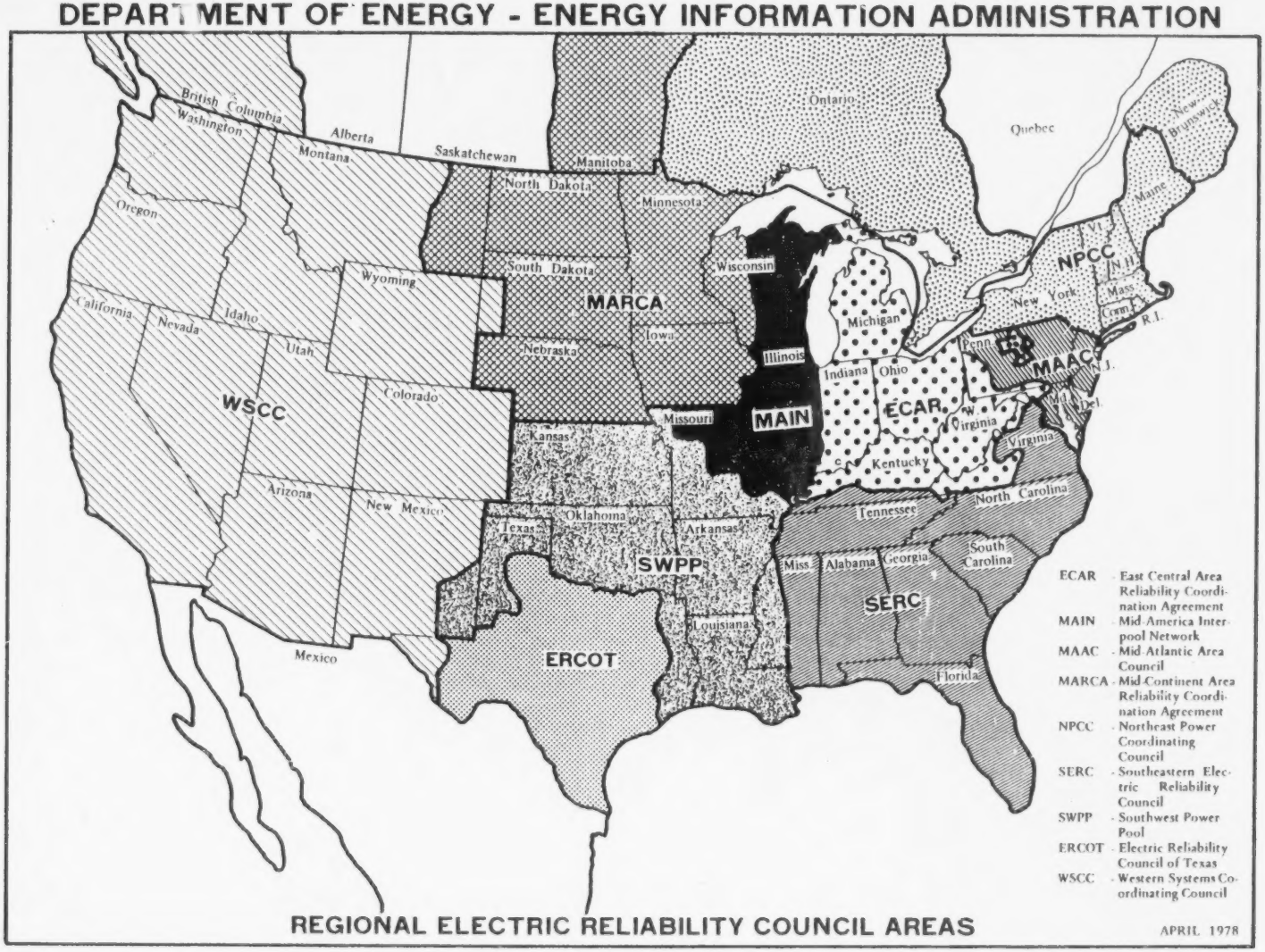
SOURCE: U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978.

TABLE 16

ELECTRIC GENERATING CAPACITY CHANGES PLANNED FOR SERC, 1978-87
(Megawatts)

| Type of Fuel | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coal - New | 2,127 | 391 | 1,000 | 2,014 | 3,624 | 2,402 | 1,040 | 1,240 | 1,841 | 4,689 | 20,368 |
| Coal - Uprate | 201 | 74 | 8 | – | – | – | – | – | – | – | 283 |
| Coal - Retire | – | – | – | – | 78 | – | 243 | – | 57 | – | 378 |
| **Coal - Total** | **2,328** | **465** | **1,008** | **2,014** | **3,546** | **2,402** | **797** | **1,240** | **1,784** | **4,689** | **20,273** |
| Uranium - New | 1,701 | 3,223 | 6,425 | 2,393 | 1,145 | 5,320 | 6,656 | 3,663 | 2,185 | 1,280 | 33,991 |
| Uranium - Uprate | – | 36 | 36 | 35 | – | – | 35 | 31 | – | – | 173 |
| **Uranium - Total** | **1,701** | **3,259** | **6,461** | **2,428** | **1,145** | **5,320** | **6,691** | **3,694** | **2,185** | **1,280** | **34,164** |
| No. 6 Oil | 261 | – | 775 | 761 | -90 | -600 | -32 | – | -212 | – | 863 |
| No. 2 Oil | – | – | -92 | 718 | 60 | 65 | 463 | -110 | 37 | -8 | 1,103 |
| Natural Gas | 20 | -29 | – | – | – | – | – | – | -29 | – | -38 |
| Waste Heat | 10 | – | – | – | – | -69 | – | – | – | – | -59 |
| Pumped Hydro | 1,540 | 240 | 379 | – | 2,855 | 384 | 155 | – | – | – | 5,553 |
| **Total** | **5,860** | **3,935** | **8,531** | **5,921** | **7,516** | **7,502** | **8,074** | **4,824** | **3,735** | **5,961** | **61,859** |

SOURCE: U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978.


DEPARTMENT OF ENERGY - ENERGY INFORMATION ADMINISTRATION
British Columbia
Washington
Alberta
Saskatchewan
Manitoba
Ontario
Quebec
New Brunswick
Montana
North Dakota
Minnesota
Oregon
Maine
Vt.
N.H.
NPCC
Wisconsin
South Dakota
Wyoming
MARCA
Michigan
New York
Mass.
Conn.
R.I.
California
Nevada
Idaho
Utah
Iowa
Nebraska
Illinois
Penn.
MAAC
N.J.
Indiana
Ohio
WSCC
Colorado
MAIN
ECAR
Md.
Del.
Missouri
W. Virginia
Virginia
Kansas
Kentucky
Arizona
New Mexico
Oklahoma
Tennessee
North Carolina
Texas
Arkansas
SWPP
Miss.
Alabama
Georgia
South Carolina
SERC
Louisiana
ERCOT
Mexico
Florida
ECAR - East Central Area Reliability Coordination Agreement
MAIN - Mid-America Interpool Network
MAAC - Mid-Atlantic Area Council
MARCA - Mid-Continent Area Reliability Coordination Agreement
NPCC - Northeast Power Coordinating Council
SERC - Southeastern Electric Reliability Council
SWPP - Southwest Power Pool
ERCOT - Electric Reliability Council of Texas
WSCC - Western Systems Coordinating Council
REGIONAL ELECTRIC RELIABILITY COUNCIL AREAS
APRIL 1978

MAP 1

TABLE 17

ELECTRIC GENERATING CAPACITY CHANGES PLANNED FOR ECAR AND MAIN, 1978-87
(Megawatts)

| Type of Fuel | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coal - New | 3,347 | 1,707 | 5,121 | 3,950 | 4,465 | 5,126 | 4,976 | 8,775 | 3,130 | 6,570 | 47,167 |
| Coal - Uprate | – | – | 43 | 140 | – | – | – | – | – | 53 | 236 |
| Coal - Derate | 27 | 64 | – | 86 | 13 | 71 | – | – | – | – | 261 |
| Coal - Retire | 662 | 34 | 58 | 108 | – | – | 85 | 529 | – | – | 1,476 |
| **Coal - Total** | **2,658** | **1,609** | **5,106** | **3,896** | **4,452** | **5,055** | **4,891** | **8,246** | **3,130** | **6,623** | **45,666** |
| Uranium - New | 1,100 | 1,048 | 2,141 | 3,490 | 7,029 | 1,439 | 1,774 | 2,439 | 1,248 | 4,162 | 25,870 |
| Uranium - (Net) Uprate | 548 | – | 30 | -740 | 475 | 740 | 30 | – | – | – | 1,083 |
| **Uranium - Total** | **1,648** | **1,048** | **2,171** | **2,750** | **7,504** | **2,179** | **1,804** | **2,439** | **1,248** | **4,162** | **26,953** |
| No. 6 Oil | 1,867 | 1,285 | – | – | – | -76 | – | -42 | – | -114 | 2,920 |
| No. 2 Oil | 377 | 176 | 146 | 666 | 78 | 327 | 427 | 305 | 446 | -72 | 2,876 |
| Natural Gas | – | -6 | -21 | – | 6 | – | – | – | – | – | -21 |
| Pumped Hydro | – | – | 64 | – | – | – | – | – | 250 | 500 | 814 |
| **Total** | **6,550** | **4,112** | **7,466** | **7,312** | **12,040** | **7,485** | **7,122** | **10,948** | **5,074** | **11,099** | **79,208** |

SOURCE: U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978.

TABLE 18

PROJECTED COAL DEMAND FOR NEW ELECTRIC GENERATING PLANTS PLANNED FOR SERC, 1978-87

| Year | Net New Plant Capacity (Megawatts) | Estimated Output* (Megawatt Hours) | Estimated Coal Requirement* (1,000 Tons) | Kentucky's Projected Share* (1,000 Tons) |
|---|---|---|---|---|
| 1978 | 2,328 | 10,196,640 | 4,250 | 1,828 |
| 1979 | 465 | 2,036,700 | 850 | 365 |
| 1980 | 1,008 | 4,415,040 | 1,840 | 791 |
| 1981 | 2,014 | 8,821,320 | 3,675 | 1,580 |
| 1982 | 3,546 | 15,531,480 | 6,470 | 2,783 |
| 1983 | 2,402 | 10,520,760 | 4,384 | 1,885 |
| 1984 | 797 | 3,490,860 | 1,455 | 625 |
| 1985 | 1,240 | 5,431,200 | 2,263 | 973 |
| 1986 | 1,784 | 7,813,920 | 3,256 | 1,400 |
| 1987 | 4,689 | 20,537,820 | 8,557 | 3,680 |
| **Total** | **33,991** | **148,880,580** | **62,034** | **26,674** |

*See text for description of methodology.

SOURCE: New plant capacity was calculated from data in U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978, supplemented by calls to utilities.

TABLE 19

PROJECTED COAL DEMAND FOR NEW ELECTRIC GENERATING PLANTS PLANNED FOR ECAR AND MAIN (LESS KENTUCKY) 1978-87

| Year | Net New Plant Capacity (Megawatts) | Estimated Output* (Megawatt Hours) | Estimated Coal Requirement* (1,000 Tons) | Kentucky's Projected Share* (1,000 Tons) |
|---|---|---|---|---|
| 1978 | 2,291 | 10,035 | 4,181 | 688 |
| 1979 | 1,481 | 6,487 | 2,703 | 445 |
| 1980 | 4,411 | 19,320 | 8,050 | 1,398 |
| 1981 | 3,021 | 13,232 | 5,513 | 907 |
| 1982 | 4,267 | 18,693 | 7,789 | 1,281 |
| 1983 | 2,831 | 12,400 | 5,167 | 850 |
| 1984 | 3,709 | 16,245 | 6,769 | 1,114 |
| 1985 | 6,868 | 30,082 | 12,534 | 2,062 |
| 1986 | 2,480 | 10,862 | 4,526 | 745 |
| 1987 | 5,450 | 23,871 | 9,946 | 1,636 |
| Total | 36,809 | 161,223 | 67,176 | 11,050 |

*See text for description of methodology.

SOURCE: New plant capacity was calculated from data in U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978, supplemented by calls to utilities.

TABLE 20

PROJECTED COAL DEMAND FOR NEW ELECTRIC GENERATING PLANTS PLANNED FOR KENTUCKY, 1978-87

| Year | Net New Plant Capacity (Megawatts) | Estimated Output* (Megawatt Hours) | Estimated Coal Requirement* (1,000 Tons) | Kentucky's Projected Share* (1,000 Tons) |
|---|---|---|---|---|
| 1978 | 367 | 1,607,460 | 670 | 670 |
| 1979 | 128 | 560,640 | 234 | 234 |
| 1980 | 695 | 3,044,100 | 1,268 | 1,267 |
| 1981 | 875 | 3,832,500 | 1,597 | 1,597 |
| 1982 | 185 | 810,000 | 338 | 338 |
| 1983 | 2,224 | 9,741,120 | 4,059 | 4,059 |
| 1984 | 1,182 | 5,177,160 | 2,157 | 2,157 |
| 1985 | 1,378 | 6,035,640 | 2,515 | 2,515 |
| 1986 | 650 | 2,847,000 | 1,186 | 1,186 |
| 1987 | 1,173 | 5,137,740 | 2,140 | 2,140 |
| Total | 8,857 | 38,793,660 | 16,164 | 16,164 |

*See text for description of methodology.

SOURCE: New plant capacity was calculated from data in U.S. Department of Energy, *Additions to Generating Capacity 1978-87 for the Contiguous United States, As Projected by the Regional Electric Reliability Councils in their April 1, 1978 Long Range Coordinated Planning Reports to the Department of Energy*, Washington, 1978, supplemented by calls to utilities.

plants. A heat rate of 10,000 Btu per kilowatt hour was used to convert the kilowatt hours of electricity into tons of coal required. Kentucky's share of the new markets in SERC and ECAR was calculated on the basis of market share existing in 1977. However, all new Kentucky power plants were arbitrarily assumed to be fired by Kentucky coal.

The numbers assigned to the coking coal market and the export market are both related to the prospects of the steel industry. The U.S. steel industry appears to be coming out of its four-year slump, and imported coke from Germany has grown rapidly during the past two years. If German coke is not available in the 1980s, demand for coal will decline because of the shortage of coking capacity in the U.S. The Japanese steel industry, which is the major export market for U.S. coking coal, is in a slump and is also turning more and more to other sources of coking coal. At any rate, Kentucky is not well situated to serve the export market and, therefore, little growth in export coal is expected without some major new initiatives.

The most difficult market to assess is the demand for coal as an industrial fuel. The data on current coal consumption are collected by the U.S. Department of Energy by Mining District, which causes data on shipments from eastern Kentucky to be comingled with shipments from Virginia and part of West Virginia. However, the residual not accounted for in other markets in 1978 is about 24 million tons. The 1979 consumption is not likely to be higher than 24 million tons because of the short-term availability of gas, but utilization of coal is expected to increase in this market sector as the impact of the Industrial Fuel Use Act of 1978 begins to be felt.

The conversion of coal into synthetic fuels offers the best hope for growth to the coal industry. Unfortunately, the industry impact will be small during the time period of this forecast. The H-Coal Pilot Plant and the Pikeville Low-Btu gas project are expected to start up in 1980 and will consume about 200,000 tons per year. The SRC-1 plant is expected to start operating in 1983 and consume about two million tons of coal per year. Several other larger projects are expected to come on stream in the late 1980s or around 1990. The data in Table 21 are the summary tabulations of the above factors that might affect the demand for coal. This tabulation should not be considered as having more validity than the above stated conditions and assumptions warrant.

TABLE 21

PROJECTED MARKET DEMAND FOR KENTUCKY COAL BY MARKET SEGMENT, 1978-87
(Millions of Tons)

| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|---|---|
| Steam | 99* | 100 | 103 | 107 | 111 | 118 | 122 | 128 | 131 | 138 |
| Coking Coal | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Retail | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Export | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Industrial | 24 | 25 | 26 | 27 | 28 | 28 | 28 | 28 | 28 | 28 |
| Synthetic Fuel | – | – | ** | ** | ** | 1 | 2 | 2 | 2 | 2 |
| Total | 137* | 139 | 143 | 148 | 153 | 161 | 166 | 172 | 175 | 182 |

*Actual data.
**Less than a million tons.

SOURCE: Kentucky Department of Energy (unpublished).